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ABSTRACT

This proceedings provides teachers with a review of current research and innovative programs and practices viewed from an international perspective and offers to improve the quality of teacher education worldwide. The World Assembly theme was supported by plenary sessions and research-based paper presentations focusing on four topics: (1) redefining inservice and preservice teacher education for a technologically-linked interdependent world; (2) promoting professional qualities of teachers and teacher educators to improve existing knowledge of the personal, organizational, and social factors which influence the career-long learning and development of teachers and teacher educators; (3) improving the quality of teacher education through curriculum development to remodel curricula and prepare teachers and teacher educators for the 21st century with an openness to diversity and the multimedia superhighway; and (4) redefining excellence in education by fostering partnerships between teachers/higher education and business/industry in a global marketplace and involving business/industry and teacher/higher education in collaborative activities for mutual benefit. The report's seven sections include research and analysis by education leaders worldwide; a compilation of keynote and concurrent session papers delivered by Omani education leaders and scholars; academic papers presented during concurrent sessions by international educators; and the World Assembly communique and recommendations. (SM)

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ED 433 301

Promoting Quality Teacher Education for an Interconnected World

ICET

International Yearbook on Teacher Education 1997

Volume I

International Council on Education for Teaching
44th World Assembly Proceedings
Muscat, Sultanate of Oman

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His Majesty Sultan Qaboos bin Said

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Promoting Quality Teacher Education for an Interconnected World

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Promoting Quality Teacher Education for an Interconnected World

International Yearbook on Teacher Education 1997

Proceedings include:
Opening Ceremony Presentations,
Keynote Frank H. Klassen Lecture,
C.Y. Tung Lecture,
Plenary Session Addresses,
Addresses and Papers on Education in Oman,
Concurrent Session Papers,
and
Closing Ceremony Presentations

from the
Forty-Fourth World Assembly of
The International Council on Education for Teaching
December, 1997
Muscat, Sultanate of Oman

(Including the World Assembly Communique and Recommendations submitted by ICET to UNESCO)

International Council on Education for Teaching

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ICET conducts an annual World Assembly as a forum for the worldwide educational community on matters related to national development and teacher education, and publishes a volume of proceedings, the International Yearbook on Teacher Education.

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ICET World Assemblies and the publication of the resulting World Assembly proceedings, *The International Yearbook on Teacher Education,* are the results of voluntary professional efforts from numerous individuals and organizations. ICET is deeply indebted to all who contributed to the 44th ICET World Assembly convened in the Sultanate of Oman under the theme of *Promoting Quality Teacher Education for an Interconnected World.* Their support, their enthusiasm, and their unrelenting hard work achieve a pivotal education forum that successfully advanced the knowledge base of its participants in their quest to improve the quality of teachers and to reform the schools in their own nations.

ICET is most grateful and extends its profound appreciation to His Excellency Yahya bin Mahfoodh Al Manthri, esteemed ICET Trustee and Minister of Higher Education, for his historic leadership in hosting the 1997 ICET World Assembly and for welcoming to Oman, educators from around the world.

To His Excellency Salim bin Mustahail Al Maa'shani; Undersecretary for the Ministry of Higher Education, Chair for the 1997 World Assembly Executive Committee, and innovative educational entrepreneur; ICET wishes to express deep gratitude for his role in personally overseeing the publication of this *1998 ICET International Yearbook on Teacher Education* as well as his efforts to enlist the cooperative participation and financial support of the Omani business community on behalf of ICET and the World Assembly.

ICET is especially thankful to Dr. Rawya Saud Al Busaidi; Director General for Colleges and Higher Institutes at the Ministry of Higher Education, Head of the World Assembly Host Committee, and Chair of the Conference Organization Committee; for her outstanding help in accomplishing an exceptional World Assembly and the publication of this book.

To Dr. Mohamed El-Shibiny, ICET Vice President for the Middle East and Advisor to the Omani Minister of Higher Education, ICET is grateful for his wise counsel, high principles, and dedication to advance ICET's global mission and the world Assembly in the Sultanate of Oman.

We are especially thankful to ICET's President, H.E. Dr. Ali Mohamed Fakhro; Administrative Assistants, Ms. Megan Fotheringham and Mrs. Betty Pfaff; and to the many committed professionals throughout Oman's education community whose collective efforts assured that the 44th ICET World Assembly achieved educational excellence and impact worldwide.

Sandra J. Klassen
Executive Director

PREFACE

The *International Yearbook on Teacher Education* is a source of global expertise. It provides the reader with a review of current research and innovative programs and practices viewed from an international perspective and offers to improve the quality of teacher education worldwide. The papers and recommendations selected for publication in this 1998 volume are the product of the 44th ICET World Assembly, hosted by H.E. Yahya bin Mahfoodh Al Manthri, Minister of Higher Education, Sultanate of Oman.

To create this volume, ICET invited eminent educators from Africa, Asia and the Pacific, Europe; the Middle East; South America; Central America and the Caribbean to address the World Assembly Theme: *Promoting Quality Teacher Education for an Interconnected World*. The Theme recognized that there is a pressing need to reconceptualize and restructure teacher education so as to develop the kind of professional teachers and teacher educators required to confront the technological challenges of the next millennium. It is no longer a question of whether teachers and teacher educators should utilize information and communication technology. In an increasingly interconnected world, brought about by the application of technological advances to all sectors of society, quality teacher education necessitates the active and innovative exploration of how best to capitalize on the strengths and to avoid the negative effects of information and communication technology, including the development of national and international partnerships within teacher education as well as between teacher education and business or industry.

The World Assembly Theme was supported by plenary sessions and research-based paper presentation focusing on four topics as follows:

Topic One

Redefining in-service and pre-service teacher education for a technologically-linked interdependent world; to capitalize on advances in information and communication technology, such as multi-media and Intranet/Internet, while being sensitive to the effects of intranational/ international linkages through information and communication technology especially in terms of at-risk or special groups.

Topic Two

Promoting professional qualities of teachers and teacher educators to improve existing knowledge of the personal, organizational, and social factors which influence the career-long learning and development of teachers and teacher educators including the impact and opportunities of information and communication technology.

Topic Three

Improving the quality of teacher education through curriculum development to remodel curricula in order to prepare teachers and teacher educators for the 21st century with an openness to cultural diversity and capitalizing on the multimedia superhighway by connecting teaching and learning to the Internet and other distance learning facilities.

Topic Four

Redefining excellence in education by fostering partnerships between teacher/higher education and business/industry in a global marketplace and involve business/industry and teacher/higher education in collaborative activities for mutual benefit including the impact of information and communication technology for increasing such collaborative opportunities.

This volume is comprised of seven sections.

Education leaders from Australia, Bahrain, Belgium, Nigeria, Oman, Switzerland, and the United States were invited to deliver the World Assembly Keynote and Plenary speeches. Their research and analysis comprise PART I, II, III and IV of this volume.

In particular, PART III highlights the *CY Tung Forum on the Interdependence of Business and Higher Education,* a unique leadership activity featured during each World Assembly to foster private/public sector cooperation for the improvement of human resources, international understanding, and economic development.

PART V is a compilation of keynote and concurrent session papers delivered throughout the conference by Omani education leaders and scholars. This section emphasizes the current structure, standards, and vision of Oman's education system as well as the contributions of Oman's scholarly research to the 44th World Assembly Theme and Topics.

PART VI of this volume includes academic papers presented during concurrent sessions of the World Assembly by educators representing all world regions and are organized, alphabetically by the surname of the first author listed under the specific topic addressed in each paper.

PART VIII of this volume includes the World Assembly Communique and Recommendations; a synthesis of the salient ideas, issues, and policy recommendations presented and deliberated at the 1997 World Assembly; as well as the Closing Ceremony Remarks by H.E. Yahya bin Mahfoodh Al

Manthri, Minister of Higher Education, Sultanate of Oman.

The book concludes in PART VIII with an Index listing all authors alphabetically by surname.

The 1998 *ICET International Yearbook on Teacher Education* outlines key issues confronting educators and suggests successful strategies and practices for educators to model on the local, national, and international level in pursuit of quality teacher education for an interconnected world.

Ali M. Fakhroo
1997 ICET President

INTRODUCTION

The ICET 44th World Assembly was held in Muscat, Sultanate of Oman, from December 15 to 21, 1997, under the patronage of the Ministry of Higher Education and its Minister H.E. Yahya bin Mahfoodh Al Manthri who welcomed the participants during the Opening Ceremonies.

Scholars, practitioners, administrators of universities, colleges, departments and institutes of education as well as government agencies and professional organizations came from all over the world to participate in this World Assembly and contribute to its theme through the exchange of ideas, research findings and professional experiences.

The theme of the 44th World Assembly is **"Promoting Quality Teacher Education for an Interconnected World"** and it touches upon major issues facing the educational world today and the urgency to properly prepare teachers to meet these challenges.

Within the framework of the theme, four topics have been developed during the plenary and concurrent sessions of the conference. The four topics are:

1. Redefining in-service and pre-service teacher education for a technologically linked interdependent world
2. Promoting professional qualities of teachers and teacher educators.
3. Improving the quality of teacher education through curriculum development.
4. Redefining excellence in education by fostering partnerships between teacher/higher education and business/industry in a global marketplace.

The authors of concurrent session papers were requested to present their latest research findings and programs related to one of these topics. As a result, many papers were delivered and openly discussed during the concurrent sessions. Rapporteurs were appointed for all sessions and were asked to take notes and summarize the presentations for the purpose of writing the final World Assembly report and recommendations which appear in this publication.

It is our wish that this compendium will provide fruitful reflection on the issues tackled during this 44th World Assembly as well a sound basis for enlightened exchanges in the field of education in general and of teacher education in particular.

H.E. Salim bin Mustahail Al Ma'shani
Undersecretary for the Ministry of Higher Education

MESSAGE OF WELCOME: OMAN

Your Highness Sayyid Assaad bin Tariq Al Said, conference patron,
Your Excellency The President of ICET,
Your Excellencies,
Our dear guests

Dear Participants

In the name and blessing of Allah, we announce the opening of the 44th conference of ICET convening in the Sultanate of Oman. I avail myself of this occasion to extend our thanks to H.H. Sayyid Assaad bin Tariq Al Said for kindly acting as patron of the conference.

During the last twenty years the Sultanate of Oman has witnessed great development in the various aspects of economic, social, cultural and scientific life, all within an integrated future vision of national objectives – this future vision extends to the year 2020 with the aim of accommodating the requirements of the 21st century.

Education in Oman has been considered a most reliable support of all the endeavors made to substantialize the future vision of overall development. With this in mind, dynamic development and reform in quantity and quality have been experienced, having as a main target the provision of highly qualified and skillful manpower required for the specialized areas of development plans.

In line with this, the educational policies maintained close interaction and collaboration with governmental and non-governmental institutions which prompted the updating of educational objectives and curricula with the aim of accommodating the variables of the present age and the labor market needs. To put this into action the Sultanate of Oman introduced state-of-the-art technology into teaching and learning methodologies at the various levels of general education, technical education and University.

Dear audience,

The main theme of the series of lectures, presentations, research and studies to be delivered in this conference for deliberations and discussion emphasizes an issue of paramount significance in the present time, which is the question of promoting curriculum policies and instructional methods of teacher education in harmony with the impact and challenges of the present changes in concepts, sciences, sociology and economics, which our closely interconnected world

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has experienced during the last twenty years. There has been fascinating progress in modern technologies; computer applications, communications and Internet information systems in addition to the advanced educational technological resources.

While discussing, in this conference, the necessity to introduce modern technology and modern innovations into the educational system, being seen as integral part in the various levels of education decision-makers, teachers and the community. In spite of the hardship we have to step forward in strong determination to maximally benefit from these modern information technologies with the aim of making the best possible use in promoting our instructional methods so that they should cope with the requirements of education of our young generation of students, with an awareness of the intellectual, cultural, social and economic changes dominating our life.

We are now on the verge of the 21st century trying to foresee the future with all the anticipated advancement in sciences and knowledge in the various aspects of life. This entails that we work hard in steering education into the right track of development and progress. Modern technologies of communication, information systems and the highlighting of research findings in our educational institutions will be the tools we need if we were to cope with the changes of the approaching century.

In addition to the emphasis the conference puts on discussion of technology-related matters of education with a special view to teacher education, the conference will deliberate on two equally important issues.

The first of these two issues deals with the interdependence of higher education and private sector business and projection of manpower potentials. For this end we have extended invitations to an elite gathering of businessmen and educationists from the Sultanate of Oman and from among the conference participants to exchange views and experiences on the best possible means to merge higher education and manpower requirements of qualified and skillful experts and technicians. This ensures the realization of such interdependence between the programs delivered in higher education institutions and the requirements of labour market.

The second issue, which is by no means less in importance than the first, is that we will hold two brainstorming sessions to be attended by teacher education decision-makers together with some of the conference participants.

The goal of these two sessions is to exchange teacher education related

information and experiences of the various countries participating in this conference and to further consider means of optimally using this exchange of views and experiences n order to achieve the targeted international merger.

In the end I would like to express my sincere thanks to all those who contributed to the success and implementation of conference functions and extend a cordial welcome to all participants from the different countries for the trouble of travelling all the way to share the functions of this conference with us in the Sultanate of Oman.

Yahya bin Mahfoodh Al Manthri,
Minister of Higher Education,
Vice-Chancellor of Sultan Qaboos University,
Sultanate of Oman.

MESSAGE OF WELCOME: (ICET)

On behalf of the Boards of Directors and Trustees of the International Council on Education for Teaching (ICET), we welcome your partnership in *Promoting Quality Teacher Education for an Interconnected World* at the 44th World Assembly, convening in Muscat, Sultanate of Oman, December 15-20, 1997.

The 1997 World Assembly theme recognizes that it is no longer a question of whether teachers and teacher educators should utilize information and communication technology. In an increasingly interconnected world, brought about by the application of technological advances to all sectors of society, quality teacher education necessitates the active and innovative exploration of how best to capitalize on the strengths and to avoid the negative effects of information and communication technology, including the development of national and international partnerships within teacher education as well as between teacher education and business or industry. As a consequence, there is a pressing need to reconceptualize and restructure teacher education so as to develop the kind of professional teachers and teacher educators required to confront the technological challenges of the next millennium.

In an era when the new information technologies are forcing change at a meteoric rate, it is appropriate that the Sultanate of Oman host a World Assembly confronting the educational implications of these rapid technological advances. His Majesty Sultan Qaboos has shaped a modern nation in less than three decades by embracing educational excellence through monumental change and reform.

Our Official World Assembly Host, His Excellence Yahya bin Mahfoodh Al Manthri, Minister of Higher Education, Vice-Chancellor of Sultan Qaboos University and ICET Trustee, has implemented the Sultan's vision for educational reform and development through his own inspired leadership and personal dedication to education.

ICET especially welcomes you, the leading international education practitioners, scholars, administrators, and policymakers, because it is you who will be instrumental in shaping the use of the new information technologies by the education systems of the world.

In the International Bureau of Education's (IBE) 45th International

Conference on Education Recommendations it states, "The new information and communication technologies represent one of the key elements in a changing world... decisions about the applications of new information technologies should be taken with the objective of improving the quality of education for all and of enabling teachers to carry out their role of guide and advocate of learning... new technologies should be used to encourage communication and networks among (educators) nationally and internationally..."

In light of this direction from UNESCO and IBE, ICET is pleased to announce that this year's World Assembly will initiate a *Network for Teacher Education Research and Development* to promote collaborative research and development activities that generate and share new knowledge and improved practices in pre-service and in-service teacher education.

Together we will examine national and international research, programs, and strategies which enable teacher education and schools to respond effectively to the challenges and the opportunities offered by the revolution in communication media. This World Assembly provides an opportunity for you to share ideas of innovative practices and successful programs in an atmosphere of mutual benefit and cooperation. We welcome your expertise at the 44th ICET World Assembly and invite you to participate fully in discussions, meetings, and activities throughout the week and during your stay in the Sultanate of Oman.

Ali Mohamed Fakhro
ICET President

Sandra J. Klassen
ICET Executive Director

December, 1997

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PART I

Opening Ceremony Presentations

Address by
H.H. Sayyid Assaad bin Tariq Al Said
Secretary General
of the Higher Conferences Committee

Your Highnesses
Your Excellency the President of the International Council on Education for Teaching
Your Excellencies the Ministers
Our dear guests
Dear audience

I have the great pleasure to open the 44h Conference of the International Council on Education for Teaching convening in Muscat by invitation from the Ministry of Higher Education. I have the great honor to convey the greetings of H.M. Sultan Qaboos bin Said , may God bless him, wishing you all success in the efforts you exert to realize and achieve the Conference goals.

I would like to extend a cordial welcome to all the participants who came from different countries with the aim of exchanging views, experiences and information for further development and promotion of teacher education policies and modernization of instructional and educational methods, so that they cope with the flow of intellectual, technological, scientific and socio/economic changes of the present time .

I am absolutely happy that your Conference is dealing with various topics of great importance to the international efforts of steering teacher education policies, with a special view to the impacts of information technologies, Internet and satellite facilities, which made new knowledge and research findings available globally for educationists to benefit from.

Modernization of education and improvement of teacher education methodologies in the present time necessitate that more efforts are to be made by educationists if education is to keep pace with the fascinating progress in the various areas of science and technology, with the world on the verge of the 21st Century .

It is doubtless that this tremendous gathering of intellectuals and educationists, who came from many Arab and international universities to participate in the Conference, will remarkably contribute to putting education policies and teacher education into a more closer track to the demands of the present time.

In the end I would like to welcome you once again in the Sultanate of Oman, wishing you every success in achieving the goals of the Conference.

May God help you.

Address by
H.E. Yahya bin Mahfoodh Al Manthri
Minister of Higher Education and Vice-Chancellor of Sultan Qaboos University

On the Occasion of the convening of the 44th Conference of the International Council on Education for Teaching (ICET) in the Sultanate of Oman, I have the pleasure to welcome all the participants who came to the Sultanate of Oman with the sincere aim of positive contribution to the Conference programs, activities and various intellectual, social and cultural functions.

Your presence in the Sultanate of Oman is a source of pleasure for us and we do appreciate your concern and motivation, travelling all the way, to attend the Conference. Our earnest concern to make of this conference a remarkable success has encouraged us to provide all human and technical and financial support required along the path of preparation and implementation of the Conference interactive dialogues and exchange of experiences on the topics of teacher education policies and curriculum, in line with the demands of a technologically and intellectually changing world.

The main theme of this Conference, with the emphasis it puts on the subject of promoting the professional efficiency of pre and in-service teacher education in a technologically interconnected world, is in fact, of principal implication to the development and promotion of education in general. This implies that further modernization, innovation and creative through the utilization of technology are yet to be developed. We hope that the lectures, presentations and discussions to be witnessed in this Conference will enrich teacher education concepts, with the 21st Century approaching.

I would like to express our sincere thanks to ICET for their collaboration in the convening of the Conference. Once again, thank you all – hoping that your stay will be a pleasure for you as I am sure it is for us.

Yahya bin Mahfoodh Al Manthri

His Excellency Ali Mohammed Fakhro

ICET President
Ambassador to France
Bahrain

Your Highness Sayed As'ad bin Tariq Al Said
Patron of the ceremony,
Your Excellencies Ministers and Undersecretaries, Ladies and Gentlemen

I am sure that I express the opinion and the feelings of everyone when, with the greatest pleasure and gratefulness, I convey our thanks to this wonderful, tranquil and hospital country, the Sultanate of Oman, represented by His Majesty Sultan Qaboos, its people and its government.

We are also grateful and thankful to His Excellency Yahya bin Mahfoodh Al Manthri, Minister of Higher Education, for his invitation to convene this conference here and for his working on our behalf, with the high committee for conferences, the many distinguished Omani businesses and the many, many honorable individuals in order to make the convening of this conference possible.

To those of us, who are aware of the fact that the present educational system of Oman started in the early seventies with only three primary schools, the educational progress achieved could be described as nothing less than a profound miracle of political will and social determination.

We salute Oman and its leaders.

Ladies and gentlemen.

Since its foundation ICET has tried to recognize the peaks towards which the field of education was heading. This was done through uncovering, analyzing and evaluating the effective intellectual or technological changes of our times that may have had an impact on the field of education in general and on the field of its concern, the education of teachers, in particular. Thanks to the many eminent educationists who so very kindly volunteered this services to ICET such attempt was both possible and successful.

Our 44th assembly of this year is, thus, a continuation of that approach attempting to address itself to the issue of the needed changes in the education of teachers for a technologically-linked interdependent World.

To begin with, one cannot but observe with puzzlement, how, over the years, the establishments of education, particularly the school, responded hesitatingly and sluggishly to new technological advances and forceful social changes. Its was satisfied to leave the sensitive appreciation of all that to the media and centers of research, and the rapid applications of technology to the military and business sectors.

This paradox needs to be explained and reversed, for our cherished assumption that the educational establishments are the spearheads, of intellectual and social change in society glaringly contradicts with this insensitivity and ridiculous conservatism of the educationists. Otherwise, how can we explain that after half century of an ascending revolution of the technology of informatics, communication and multimedia, educationists are still posing the most elementary questions regarding the preparation of teachers to deal with this exploding Volcano.

And even, during the limited number of occasions, when governments or politicians forced us to face the tide of this revolution, the response was narrowed to the mere buying of hardware and the mere acquainting of some educationists with the workings and applications of the apparatuses. While the intellectual aspect of understanding, analyzing, evaluating and reorienting this revolution to serve the aesthetics and value systems in the culture of the society were hardly tackled. This had, and will continue, to allow students to become victims of the complications, shortcomings and abuses of this wonderful revolution of technology.

I need not remind those of you who have already dealt with such wizards, like the Internet, the computers, the mushrooming CD roms, etc..., etc. how one is struck by the high percentage of weaknesses and shortcomings of each system, and that a lot of what is presented is either useless or incorrect or prejudiced or a mere cheap propaganda. Some of the immoral and decadent material can inflict deep wounds in the hearts, minds and souls of children.

And so we are back to the old savare one, when we had the same complaints against encyclopedias, books of history, religion, literature that were full of misrepresentations, prejudices, narrowmindedness and stupidities.

We are back to square 2 when the satellite and cable TV hit the world with a resounding promise that mankind will have finally the variety, the freedom of choice and the intellectual stimulants. Alas, the promise has been fulfilled but in the form of a cheap cafeteria food that was poorly cooked, undernutritions,

repetitions and addictive. Our youngster simply gulped more and more of that food and built sloppy fatty intellects and souls, their heroes became the lunatics and monkeys that we all know.

Is there an explanation for all that gloomy picture? yes; I believe that it is found in the way we present technology and learning tools to teachers and students. We present them with such so-called neutrality and with such disregard to any controlling value and moral systems that they end up turning gradually into nightmares in our daily life, but especially in the daily life of our children.

Therefore, whether learning through old tools or teaching through new technologies, the basic issue will remain the same: that of the dynamism of educational process that will prepare teachers and their students alike to be come intellectual revolutionists who will not allow themselves to drown in the stagnant filth of lies, injustices and maneuverings of their society and the world at large.

And so, ladies and gentlemen, when we would have the education that brings out the brilliance of the critical intellect, the resilience of the spirit whereby both faculties defy all kinds of dominance, be it that of advertisement,. business, governments ideologists or present thinkers; it is then that we need not be afraid of neither the old dangers nor the new ones.

God's Mercy upon all of you
and thank you.

PART II

Keynote: Frank H. Klassen Lecture

Part II: Keynote Frank H. Klassen Lecture
Theme: Promoting Quality Teacher Education for an Interconnected world

Media-Rich Science Learning Environments as Help for Improving the Teaching of Science and the Education of Science Teachers

Goéry Delacôte

Introduction

Education, to be successful, and science education is no exception, has to rely on a rich repertoire of experiences on which to build conceptual learning. These experiences pave the way to the construction of meaning, which in turn supports meaning. It also helps to entertain, create or re-create a sense of wonder, which becomes the true incentive for learning. It is therefore important to think of education in ecological terms, not limiting the children's experiences to what can possibly take place in the classroom. The role of alternative learning environments therefore becomes critical as a prelude, a complement or a follow-up to the school-based learning process.

Experience comes from interaction with a learning environment. The design of stimulating environments, and the guided process of giving access to them, facilitating exploration and contributing to meaning being built, are therefore critical steps in making the learning easier. This requires that a learning environment should be composed of interactive things (objects, exhibits), of connective tools (computers, multimedia) and of attentive people (explainers, brokers of information, experts, teachers, etc.). Young children, even more than adults, are highly sensitive to experience and media which, if well designed, can be very useful.

At the San Francisco Exploratorium, a sort of learning laboratory open to the public founded in 1969 by Frank Oppenheimer, we have designed together with a publisher, the Explorabook, a book which is also a toy (Cassidy and Exploratorium, 1991), as well as the very recently published Zap Book (1997). The Explorabook incorporates a magnet and other physics flat tools, such as a mirror made out of mylar, a Fresnel lens and a grating, which allow young children to design and carry out their own experiments. In a relatively unique way, the book has moved from a classical story-telling, narrative-based

approach to a content that leads to a story-building experience: the young reader uses the book to perform an experimental investigation, to draw a conclusion and to come up with a story of what happened while he was experimenting. The non-linear and non-sequential design of this activity-based book is very similar to that found in the design of some contemporary interactive multimedia. The fact that about one million copies of this book have been sold so far is a result of its well-adapted design and the dire need to find intriguing activities for children aged three to fifteen.

Multimedia programs can also be conceived with the idea of providing the users with the sort of information, expertise and knowledge which are needed for them to solve a problem or play a role: for instance to become a multimedia designer, to understand the local economy of a little village or to solve a water pollution problem.

Basically this sort of multimedia design tends to blur the boundary between being a narrative reader and becoming a story designer. The author of the multimedia is the one who provides the potential building blocks of the story. The user is the one who makes the story by organizing these building blocks according to a logic of sequencing and of question and answer; the user becomes the author. This important transformation is similar to the one of a learner who becomes a teacher. Multimedia games such as Myst, an adventure game where you build your own strategy, or at least make decisions while the game is going on, are of the same kind.

Phenomenon-based exhibits, little excerpts of the world, if well displayed, can generate a sense of surprise, even of wonder, which can lead the learner into a questioning mode, where formulating a question, trying out an experiment or talking to a companion are all part of an investigatory attitude. The core of this is a mental dynamic of searching for meaning supported by experience and by reasoning.

The problem then is to try to elicit the kind of learning which would be most favored by these sorts of environment.

What Sort of Knowledge is there to Learn?

One should first pay attention to the kind of knowledge that can be acquired. Here lies the first important dichotomy between knowledge acquired through any sort of media by direct or first-hand experience and by representational or second-hand knowledge. Museums generally accentuate the first sort of knowledge by bringing the child into direct contact with objects.

Libraries and networks will provide learning through indirectly represented knowledge, that is through books, films, videos, printed materials, images and sounds. An interesting place where these two sorts of knowledge clearly overlap is the augmented reality environment where you provide an experience about the world and about people experiencing it by proposing user-driven representations of the world (especially for visual experience, sound experience is more advanced). This is still a design in development

One can fine-tune the analysis about so-called first-hand knowledge by providing two sorts of access: access to the world or segments of it in keeping with true research like complexity of these segments; or access to a practically reconstructed world based on conceptual representations provided both by designers and users, a sort of post-conceptual didactic practice. In a sense it is the difference between the world as a set of people-mediated concepts and a world with concepts hidden in the background. But in both cases learning is based on experience.

It is also possible to categorize knowledge into domains, whether first- or second-hand, for instance one can discriminate between knowledge about nature, technology, the arts, oneself, other people and society, the world of man-made rules and so on. Understanding nature is about understanding natural phenomena, the underlying concepts and theories, and their relationship to the natural world. Understanding technology is about understanding the purposeful design of objects, tools, processes and systems, considering social, economic, cultural and natural constraints. Understanding the arts is about understanding alternative ways of perceiving, representing and even recreating the world.

One should consider the difference between informal and formal knowledge. Formal knowledge has to do with long chains of inferences connecting sets of principles, sets of concepts and sets of experimental evidence. Most often the use of a formal language has to be mastered and rules of logic applied, and mathematical tools become important. Informal knowledge has to do with qualitative, global and sometimes metaphorical or analogue descriptions of concepts and ideas. This is very often used as meta knowledge which helps us to figure out a reasoning pathway, an argument, the planning of a solution to a problem, the raising of a question, or the description of a connection between facts and ideas. It never relies on a long chain of logical inferences and is not a logical demonstration from first principles but rather is connected with intuition.

The Example of the Exploratorium

Let us now apply this categorization of knowledge to understand a little bit better what sort of learning could take place in some of the 'non-compulsory' environments we mentioned earlier. We will consider more extensively the case of the Exploratorium, the leader of hands-on science museums. We can assert that the unguided learning that takes place in this phenomenon-based exhibition environment is mostly of the following type. Visitors are led to do something with the exhibits. The design through specific codes induces a 'natural' doing (building, throwing, feeling sense-involving) type of personal action. The performance, in its turn, induces a surprise. Again, the design has been such that by interacting with the exhibit, the exhibit itself 'reacts' and something unexpected happens to the visitor. The next, interwoven step is the move from surprise to the question, which very often takes place through a sort of social interaction. The surprise has triggered an interest and a pleasure to share. Friends, family members and other visitors are called on to share in the awakened curiosity. Verbal explanation of the surprise takes place, further investigation may be tried, and a subtle process of progressively building a question is on its way.

Of course, the question will depend on the design of the exhibit and the pre-existing knowledge of the visitor. Nevertheless, what is central is the process by which the visitor discovers that he can raise his own questions and is pleased by so doing. The Exploratorium is a 'question generator' place!

This process clearly implies the existence of a learning environment, in this case centered on knowledge about natural phenomena, providing first-hand experience in a research-like, non-didactic, highly informal mode. It is a Copernical revolution compared with a school learning experience. However, we have found at the Exploratorium that another process of learning seems to operate. The Exploratorium is mostly a place where learning tools are being designed to match the constraint of a museum environment. Teachers working at the Exploratorium have designed learning tools based on the same ideas but which fit a school environment. These have been compiled in a collection nicknamed 'the Science Snackbook,' in four volumes (Doherty, Rathjen and the Exploratorium Teacher Institute, 1995a,b,c, 1996) and pupils in the classrooms are now redesigning these learning tools in order to learn for themselves by doing and investigating at the same time. It is a chain of induced transposition and re-creation, where something is being added to by the different actors along the chain, which facilitates this new process of learning.

There are some 650 exhibits at the San Francisco Exploratorium that allow this questioning behavior to be triggered among users, including young children. Some examples are the non-linear, turbulent, behavior of matter, optics, color and vision, sound and hearing, mathematics and mechanics, molecules, cells, and organisms. These exhibits are part of larger groups designed like interactive pieces of furniture, which can be grouped in many different ways, therefore allowing the design of an ever-changing, very flexible floor.

Examples of Media-Based Learning Environments

In another spectrum of non-compulsory environments, one may find an institution such as the Museum of the Moving Image (London) which is what I would call a place where 'media is squared' (media2), a media museum about another media (films and TV). Libraries are also media about other media, but as written material is a less well-perceived medium than photography and film, libraries provide access to second-hand knowledge only. To discover the world (real as well as imaginary) in a medium which offers an experience about a vision of the world that has been created in another medium is apparently a super-distant experience. What really happens is that such a place provides more of an experience about the film medium as a human creative activity and transforms this medium into a sort of reality.

At the San Francisco Exploratorium, in addition to experiential learning we also provide access to the same sort of media-based knowledge but mix first-hand with some second-hand experiences. This, in our mind, is the future of public learning centers: hybrid places blending experiential and representational learning. This was one part of the rationale for the creation of a Center for Media and Communication in addition to the present Center for Public Exhibition, to provide the possibility of 'exporting' the Exploratorium experience. The development of a constantly evolving World Wide Web site is a typical example of a tool that allows home users as well as school users to benefit from these new learning environments. A third component, an innovative Center for Teaching and Learning, allows educators as well as students, by using learning tools, to discover new and hopefully more efficient ways of learning (constructing knowledge, negotiating meaning and assessing performance), either in an individual or a collective mode. The basic ingredient, offered by this center which works as a second home for teachers, is access to experiential learning, reflective thinking and the use of communication technology to learn and to learn how to teach. Those are the

basic components which comprise the standards-based, cognitively informed and technologically rich professional education of teachers.

Conclusion

Through books, multimedia, exhibits and field trips (if well designed and carefully introduced), a strong experiential learning can be supported from an early age. This lays the foundation for a deeper and broader learning process which never ends and consists of acquiring experiences as well as skills in handling concepts and at mapping the former with the latter; therefore, mixing informal with formal learning. Based on this evidence, the role of science centers in the transformation of primary education can be quite significant. By design, the science centers are open and flexible in content, curriculum, time, and technology. They are also very easy to use by groups, not just peer groups, but especially family groups where social interaction is of primary importance in supporting the learning process. With little change in organization, science centers can become strategic places for helping elementary teachers to feel more supported, educated and connected in their endeavors to help young children grow into active investigators. For instance, visual and spoken dialogues over the electronic networks in a deferred mode, as well as on-line, are recent examples of fruitful interactions between our Exploratorium and San Francisco Bay area fourth grade classes involved in, for instance, investigations on weather. More importantly, teachers, in being supported in their own thinking and understanding, find the conditions that aid and expand their expertise in science teaching. They discover through their own experience what could support their pupils. Thus, science centers can become very active bases of teacher education and support, using the power of an informal approach in discovering about the world and understanding it.

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PART III

C.Y. Tung Forum on the Interdependence of Business and Higher Education

C.Y. TUNG FORUM ON THE INTERDEPENDENCE OF BUSINESS AND HIGHER EDUCATION: EDUCATIONAL INVESTMENT – A SHARING OF CONCERNS

Aflah H.S. Al Rawahy

In the name of Allah, most gracious, most merciful
Praise be to Allah, Lord of the Universe, who said in the Holy Quran after giving a parable of Spider's house:
"and such are the parable we set forth for mankind,
but only those understand them who have knowledge".
And peace and prayers be upon the nurturer and educator of the masses, Prophet Mohammed who regarded the one who seeks knowledge in this world is in the path to heaven, as he said:
"whomsoever follows a path to seek knowledge therein,
Allah will make easy for him a path to paradise".

Your Excellencies and Distinguished Guests,

I am grateful for the privilege accorded to me by the Ministry of Higher Education and ICET, to share with you some of my deep concerns and acquaint you with our Omani perspectives, on the subject of educational investment and development, as we cross into the 21st century.

The first of my concerns relates to the impact of globalization on both business and higher education. The 21st century is going to usher in the landscape of the global village, where the walls of national boundaries will be replaced by interconnected highways. And racing along these transnational highways will be ideas, technology, money and people. Everybody and everything on the move.

Are the educational systems of today's world ready or getting equipped to deal with this astonishing pace of change in the global environment?

While I have no doubt these issues are engaging your attention, I am disturbed by the policy implications that emerge when you consider that as governments are faced with a resource crunch, political compulsions, vested

interests and dictated economic strategies tend to shift priorities and more often than not social overheads like health and education become victims.

I understand that in the process of liberalization and globalization, many of the world's emerging economies which cover substantial segments of the world's population are feeling the pains that accompany sweeping changes on the economic front. The early upheavals in Central and South America and the more recent ones in South Asia have led to the World Bank-IMF combine having to take a more active role in dictating national priorities. It is here that I fear pressures may arise which could affect all that you in higher education are engaged in.

We would not want to see in consequence developing countries serving as a base camp for skilled but cheap labor while serving as ready and captive markets for the multinationals of the developed nations. Because, to my mind, such approaches will lead to the enforcement of educational strategies where the educational system in developing countries will simply produce computer operators, skilled manpower and not a well equipped intelligence to question the existing matrix of dominance. In other words, higher education will more and more be the prerogative of the developed world while emerging nations would be forced to cut down on higher education budgets and invest only on primary-secondary and vocational education. This would create for multinationals from developed countries a ready consumer mass of people who are able to read the glossy advertisements and buy their consumer products. You can easily see that for the realization of both these goals, there is no need for higher education as such, rather it is an impediment. It will therefore, be up to the educationalists to ensure that there are no winners and no losers in the globalization era in so far as education is concerned.

Your Excellencies, Distinguished Academics,

We have to provide an education system that reacts positively and scientifically towards globalization issues like

- explosion in the information technology and the surprising pace of manufacturing,
- space and genetic engineering technologies, free mobility of people, goods and financial resources,
- conflict between global and local interests,
- between economic development and its back-fire impacts on environment,

- between free-market economic philosophy and social equity,
- between the rich and the poor....

in an interacting, interdependent and ever-changing global community.

An education system that

- not only offers the generations to know how to deal with opportunities and threats of increased international and regional co-operation like WTO, GCC, EU, APEC, NAFTA etc.
- but also successfully directs theories and factual knowledge to attain community interests and welfare, provides the people with an ability to make rational judgements and choices, a courage to express their democratic rights and freedom peacefully,
- and enables them to see things clearly, to chose what is sensible for their family and the community, to disregard what is irrelevant.
- and enables them to see things clearly, to chose what is sensible for their family and the community, to disregard what is irrelevant.
- A system that stresses professional and vocational education and skill training, a system that strengthens the national beliefs, morals, ethics and traditions and the way how the younger generation may co-exist in the multi-culture borderless world,
- and above all gives them a common ground to share with other members of the society.

Ladies and Gentlemen

Adam Smith in his famous book "The Wealth of Nations" regards education as a fixed asset in terms of economy, whereas Alfred Marshal emphasis in his book "Principles of Economics" that investment in human resources as the most important investment. And before that, an Islamic Philosopher Abdul-Rahman Ibn Khaldoon, who obviously based his comments on Islamic teachings, said that the human being is the ultimate objective of all those in the nature. The investment in education is where my second concern rests.

It is to do with how governments and the business world look at education as a desirable investment. While it is perfectly true that educational investment does not fructify immediately and involves a long gestation period, it is a permanent socially beneficial action, especially in terms of improved

productivity and quality of life of the people. Any neglect of it is both shortsighted and bad economics. Education has never been a commerce. Educational institutions are not business houses, they do not generate wealth, they cannot survive without public funds or private aid. This is even truer of higher educational institutions. So far higher education in any country has been substantially supported by governments. In developed countries between 50%-80% of higher education enrollment is in public supported institutions. Even in the USA, the best of Ivy League colleges get only 30% funding from private sources. With the liberalization phenomenon and strain on resources, governments would like to dilute their support and shift the burden to the private sector. Economic policy makers in government tend to view higher education as "non-merit goods and services" under the simple logic that;

1. The subsidies are not benefiting the target audiences, implying that most of the students going to college hail from middle and upper class families.
2. The social rate of return in this sector is low, meaning that higher education really benefits the individual more than society, so why subsidize them at all?

These are specious arguments. An Omani Scholar Sheikh Al Salmy in his poem said: "The profits of knowledge outweigh any other profits".

In an era of liberalization, when a country needs trained manpower besides a cutting edge in research and development, curtailing funds to this sector could be akin to committing suicide.

Today with the unprecedented expansion of higher education it is difficult for governments to perform their role. Privatization is suggested. But this is a word that needs to be more closely examined. It signifies if I am not mistaken, the taking over of ailing, unmanaged or unwanted public sector enterprises by the private sector. But can a University be put up for sale? Privatization is an economy-related term which is hardly applicable in this context. What we really mean is private participation in the higher education sector.

To obtain this participation whether it be by corporate donations, endowments, creation of chairs, scholarships, gifts or loans to private sector needs to see a relevance of what they are participating in, to their immediate and long term needs and to benefits accruing to the community at large. This will call for the reconstruction of education. The need to understand that the problem very often is not unemployment but of unemployability. The educational content and its treatment need to relate to the requirement of the

private sector. For example, the move to vocationalise education at the first degree level to increase the employability of University graduates by providing students with skill-based education and thus industry with a semi-trained workforce and reduce the pressure on the post-graduate system. Once students find that a practical course which develops their earning potential in line with their talents is available, they will no longer mechanically opt for post-graduate qualifications that have little relevance to today's job markets. The world does not need degree waving hordes who after a college course have a vague concept of their field of learning. With globalization what is needed is competence – people with sharp problem solving abilities. So the overall attempt therefore must be to enrich the graduate degree with vocational subjects without disturbing the core subjects in such a syllabus restructuring. We have to get quality into our education. I wish we profoundly look at what Prophet Mohammed (pbuh) said in this context: "Perform your worldly duties as if you live forever and perform your Godly duties as if you die tomorrow". And: "He who performs a job (a profession, a work) should do it perfectly".

Your Excellencies, Distinguished Guests,

The third spot of my concern is the area of value-based education and the role of teachers.

The grave concern over the erosion of essential values and morals in society, has brought to focus the need for re-adjustment in the curriculum in order to make education a forceful tool for the cultivation of social and moral values. Sometimes, it seems to me that all that matters now is a good job and a fat pay. Hence our children grow up to be engineers, doctors or nothing. In the global vision of cultural plurality, education should foster universal, eternal and moral values. Such a value-based education should help eliminate obscurantism, fanaticism, violence, superstition and fatalism.

The education system must produce men and women of character and ability, nurture a spirit of tolerance and build a culture of peace. It must further the transition from the logic of force to the force of reason. As Mahatma Gandhi said, "education must promote concord in place of discord, peace in place of strife, progress in place of retrogression, integration in place of disintegration and life in place of death". While it is agreed that the comparative advantage of a nation is no longer the richness of its natural resources but the richness of its well educated manpower, capable of living up to the challenges of an ever-changing world, we cannot allow competitive spirit

and the mad rush for material gain to overshadow the norms, values and standards of our heritage.

And the key role in promoting all these values is played by the teacher. As Thorean said, "a teacher's influence extends into infinity, there is no telling where it stops". Education is what remains after you have forgotten everything you learned and it is here that the teacher leaves his stamp. While we all share conventional views on the role of the teacher I would like to suggest a different slant. Teachers who want students to learn help students become autonomous, use their individual resources, make independent choices and think in their own way. Such teachers shun signs of dependence and let students know there will be no reward for subservience. Instead of prescribing a text, they ask students to find in the library the book of greatest value to them. Instead of asking students to come up with the right answers to their questions, they encourage them to come up with new questions.

I am afraid that education at all levels has suffered down the decades with the systematic erosion in the quality of teachers. And yet I find it hard to blame teachers. From a vocation this has become a profession without the status and rewards of one. We expect from a teacher a love for imparting knowledge and building a student's character with single-minded devotion and often ignore the fact that they too are human beings with material aspirations and the good things of life. Because higher education has been largely government funded, what I call a "governmental attitude" has sometimes guided their actions and outlook of teachers. Teachers go through the process of so-called teaching without any semblance of accountability:

- either to their masters (perhaps they visualize none!),
- or their students (how are they concerned?),
- or to society at large (that's after all an abstraction!).

We would need to remedy this state of affairs drastically if our education systems have to deliver. It has to deliver teachers that bring up the generations:

- that regard acquiring education as a must,
- that pursue knowledge from birth to death,
- that value work and working as holy,
- that appreciate and preserve the uniqueness of each ones culture and heritage,
- and finally generations that understand the importance of dialogue in peaceful living.

Ladies and Gentlemen,

Now having unburdened my concerns to you, let me bring you on board Oman's ship which is sailing into the next century. However, it is fair first to say that Oman through trade has played an important role to convey knowledge and Islam to mankind. Oman has been a trading nation since time immemorial – its maritime trading history dates back to 3000 BC. For centuries Omani traders have sailed as far afield as China, India and East Africa, taking Omani goods such as copper and frankincense to these areas and trading them for essential and luxury goods typical of those regions. Oman's geographical position made it a central point in most ancient trade routes and hence a hive of trading activity.

Present-day Oman with H.M. Sultan Qaboos' dynamic leadership is moving slowly but surely towards regaining and increasing its glory with education and human resources developments as its basic component. Since 1970 H.M. Sultan Qaboos' speeches touched one way or the other on this topic. In August 1970 when he came to power he said, "the process of educating and training our people should start as soon as possible, in order for the Omani to rule the country as Omani nationals in the long run".

Hence, educating Omanis even under the shadow of a tree was his main concern. And in his speech to the nation on the occasion of celebrating the 27th anniversary of National Day, where he announced 1998 as the year of the private sector, he clearly emphasized the objectives by sending the following message:

"The basic law of our country, provides a true, clear picture of the principles that we shall follow in our domestic and foreign policies, which are designed to build our Omani people, and to develop their capabilities and their scientific and practical experience, because they are corner-stone of all our goals, plans and achievements. Everyone should be conscious of this era. And everyone in a position of responsibility must work accordingly".

Distinguished Guests,

Oman with these directives is sailing into the 21st century with determination and vision. We call it "Vision 2020" which was approved in 1995 and charts the course of our destiny for the next 25 years or so.

The main elements of human resources development strategy in this vision include:

a) Provision of free, efficient and cost effective basic education of high quality that puts more emphasis on modern sciences, for all Omanis regardless of sex, financial status or physical and mental conditions.

b) Provision and encouragement of technical education and vocational training for all stages of general education in order to meet the labor market demand for different technical specializations.

c) Adoption of advanced systems for technical education and vocational training that enable the graduate to cope with the rapid technological developments.

d) To provide a high standard university education and post-graduate study programs that comply with the labor market needs in a rapidly changing global world, and meet at the same time the requirements for community oriented applied research programs.

e) Encouragement of the private sector to invest in educational institutions and education media business in order to widen and improve education opportunities.

f) Modernization and promotion of curriculum, teaching methods, and teacher's training systems and programs.

Ladies and Gentlemen,

Education reform requires technical expertise, financial resources, effort, time and community participation, which all call for the efforts of each and every member and institution or organization in the country.

The private sector's role in investment in education should be emphasized in the coming development stage. The government of Oman has offered good incentives during the last five-year plan in order to encourage private investments in education and vocational training.

Although the private sector's response to such incentives was remarkable, the overall effect is, still limited. The number of private schools and kindergarten in 1996-97 is 106 compared to 967 State schools, while the total number of boys and girls enrolled in these private schools and kindergarten reached 12,627 compared to about half a million students in the State schools.

The private sector's role in higher education is even more limited with only 3 private colleges (1,100 students) operating the academic year 1996-97.

The private sector plays a more positive role in investment in the field of vocational training. Many private vocational training institutions have been established in various parts of the country, 19 of these are licensed to organize National Vocational Qualification (NVQ) training programs, which are fully supported and financed by the government.

The Omani investor in the field of education like any other investor anywhere and in any other field of economic activity, evaluates the feasibility

of his investment entirely on the expected financial returns. Education and training projects, evaluated by this yardstick, may or may not be feasible as the case may be for any other projects. However, from a national economic-interest point of view, investment in education and vocational training is always a viable venture.

Local higher education started only recently in Oman with most of the institutions – only one university and a number of technical and teacher's training collages – established in the 1980's. Therefore, naturally, the outcome and effect of higher education on the country's business development is still at its early stages.

Ladies and Gentlemen,

For higher education to play an effective role in promoting business and enhancing economic development in Oman and possibly in other countries during the globalization era, a number of policies and programs should be adopted. These include;

a) Establishment of research centers within the major higher education institutions to carry out research in basic sciences and other disciplines of importance to development.

b) Promote and fully support post-graduate study programs in higher education institutions through arrangements with other educational institutions, business sectors and foreign academic institutions so as to accelerate the production of new researchers and academics in various areas of importance to economic and social development.

c) Formation of special research and development network oriented towards community services and the improvement of local community life.

d) Priority is to be given to applied research that aims to deal with the country's challenges and business promotion objectives.

e) Review higher education curriculum and research programs to ensure practicability and applicability on the one hand and to ensure enrichment by professional ethics, cultural identity and moral values on the other hand.

f) Increase opportunities and accessibility to higher education for all eligible candidates by increasing the number, specializations and study disciplines of higher education institutions.

g) Provide incentives to the private sector in order to encourage private investment in education media, research programs and technology pre and in-service centers.

h) Development of an effective, quality education media and information

systems to help parents and public at large in the process of learning, monitoring, evaluating and reforming the education system.

Your Excellencies, Distinguished Guests,

To facilitate and accelerate the adoption of the suggested policies and to strengthen the partnership between business and higher education and make it more effective and profitable, I recommend the following steps:

i) The formation of a higher non-governmental commission/think-tank forum or any similar organ to look into the future vision of the country's educational system in view of the needs, requirements, challenges and opportunities of the globalization era, and the role of the private sector in the future educational system.

   Membership of the commission should represent local educational experts and specialists, religious scholars, private sector's representatives, manpower planning and development experts, economist's etc.

ii) Establishment of a National Research Fund to be financed mainly by the contributions of the private and public sectors, commercial firms in order to contribute in financing research projects and programs in higher education institutions according to priorities specified by regulations enacted for this purpose under supervision of an independent board representing educational institutions and the private sector.

iii) Formation of a Higher Quality Council to monitor and audit the education and quality assurance systems. These audit reports to be accessible and transparent to legislators, educators, academics, religious scholars and even post-graduates. An action plan to be prepared on the findings of the council to facilitate the education system to program necessary reforms.

Your Excellencies, Distinguished Guests,

I am sure I don't have to strengthen more the interdependence of business and higher education. I will only conclude by saying that the economic and social development of a nation relies upon developed human resources, and its development relies upon continuous education and training. Hence I suggest we set our paramount priorities right, these are two:

THE FIRST ONE IS "EDUCATION FOR ALL", and
THE SECOND ONE IS "ALL FOR EDUCATION".

Thank you.

PART IV

Plenary Session Addresses

GLOBAL EDUCATION FOR TEACHERS VIA INTERACTIVE VIDEO

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This paper is a report of one portion of a project called International Studies for Indiana Schools, a project sponsored jointly by Indiana University's Office of International Programs and the Center for Excellence in Education. The overall project is directed by Suzanne Gott. This paper will describe the background to the project, provide details about its execution, give information about the professional development course, "Global Education for Teachers," and summarize the contents of a videotape that will be shown in conjunction with this paper.

Background

Indiana University is one of the world's leading universities for international studies. It regularly provides instruction in 53 different languages; it hosts separate language and area studies centers that focus on Africa, East Asia, India, Inner Asia, Latin America and the Caribbean, Middle East, Poland, Russia and East Europe, Southeast Asia, and Western Europe, as well as centers on global studies. Through Indiana University's Office of Overseas Study, students have access to over 60 academic programs in 27 countries and 16 languages. Indiana University has partnerships with some 200 colleges and universities outside of the United States; it is linked with institutions worldwide through international affiliations and exchange agreements in Asia, Africa, Europe, and South America; and it annually provides instruction to more than 3000 international students who pursue undergraduate degrees in Bloomington or at one of the other seven campuses. The Office of International Programs (OIP), directed by Dean Patrick O'Meara, is responsible for the coordination of all international programs at Indiana University.

The Center for Excellence in Education (CEE) is a research and development center directed by Howard Mehlinger, whose mission is to explore appropriate applications of technology to improve teaching and learning at all levels of

education. The Center pursues its mission by conducting research and development on new applications of technology for instruction and by providing seminars and workshops to prepare educators to use current technologies more effectively.

One problem confronting OIP has been how to make Indiana University's enormous international studies resources more available to the elementary and secondary schools in Indiana.

While each of the language and area studies centers provides "outreach" programs that make available printed and film material as well as speakers to schools, it has proved difficult to make these resources easily accessible. OIP wished to explore new avenues for dissemination of international studies content; distance learning technology appeared to hold promise.

CEE is located in a splendid new building on the Bloomington campus, a facility called the Wendell W. Wright Education Building and one specifically designed to showcase the use of technology for instruction. Distance learning technology, in particular interactive video technology, is one of the special features of the Wright Education Building. CEE was seeking projects to test its capabilities at the same time that OIP was looking for ways to engage schools in international studies.

In 1994, the Ameritech Corporation, a telephone company serving five states – Indiana, Illinois, Michigan, Ohio, and Wisconsin – announced the establishment of a new, non-profit, charitable foundation called the Corporation for Education Communication (CEC). Ameritech provided CEC with $30 million and announced that CEC would provide grants to schools, colleges, universities, and other educational organizations to conduct programs in distance learning using two-way, interactive, full-motion video. The grants were to be of three main kinds: 1) equipment and wiring grants to a value of approximately $40,000 each. The grants would enable schools, colleges, universities, and others to obtain the equipment necessary to transmit and receive programs; 2) professional grants to teachers enabling them to obtain training and support so as to utilize distance learning in their courses; and 3) content development grants enabling some institutions, mainly colleges and universities, to develop programs that others on the network might use.

In 1995, Indiana University applied for and received a CEC content development grant that provided $95,000 for two years, enabling OIP and CEE to develop a distance learning program that would make international

studies content available to Indiana schools that lie within the Ameritech service area. The project, called International Studies for Indiana Schools, was extended for a third year and has been enhanced by a recent grant from the Indiana Humanities Council. The current grant is expected to expire in summer, 1998.

International Studies for Indiana Schools

The International Studies for Indiana Schools (ISIS) project was designed to share international resources with Indiana K-12 students and their teachers in the most accessible manner possible. ISIS was also designed to change the paradigm in which the University worked with schools: from outreach to inreach.

Outreach stands for the program and policy in which the University packages some portion of its resources and makes them available to schools that want them. Typical examples of outreach programs are a speaker's bureau, a film library, printed bibliographies, and other print materials organized by topic.

Inreach stands for the University making any and all of its resources available, allowing people to choose what they want, and then packaging the response in accord with the demand. This means the University must be highly responsive to its clients, if inreach is to work effectively.

ISIS provides four types of programs to the schools:

1) Pre-scheduled programs. These programs are developed after consultation with the schools. They are intended to fit the curricula of many schools and are offered at times that fit the typical school curriculum. An example of such a program is one called "Stereotypes of Japan in the U.S. Media," designed for use when schools are studying about Japan.

2) Tailored Programs. These programs are designed to meet the needs of individual teachers. The program is designed to fit a particular school or class. Once the program is developed, its existence is made known to other teachers who can request it if they wish. One example of this type of program is "Spanish Author Garcia Lorca." A teacher of the Spanish language was studying the work of Garcia Lorca in her class; she asked ISIS whether an Indiana University distinguished professor who knew Lorca personally and had written a biography about him would be able to talk to her class. The professor met with the class via interactive video and conducted most of the session in Spanish.

3) Special Events Programs. These are programs that are mounted quickly in response to newsbreaking events. The assumption is that Indiana University can provide expert interpretation of an event that is dominating the headlines. One example of such a program conducted last year was "The Death of Deng Xiaoping."

4) Global Education for Teachers. Many Indiana teachers have weak content background in international studies. We concluded that our success in bringing more international content to K-12 students would depend in part upon our ability to arouse interest in and extend understanding of international studies by their teachers. A course, called "Global Education for Teachers," was created, using advice from teachers about the topics they wanted to study. The course was first offered in spring, 1996. More details about the course are provided later.

Each school that has participated in the ISIS program has been part of a two-way video, interactive, analog network called Vision Athena. Each school, college, or university participating in the network has virtually identical equi. This equipment includes a television monitor with a camera mounted on the monitor, a video cassette recorder, a small monitor, a document camera, and a switch box. The switch box allows each site to control the image it wants to send to other site(s): videotape, a graphic, or image from the video camera. The document camera allows each site to share documents and pictures with the other site(s). The physical layout for each site varies greatly depending upon the classroom space available.

Global Education for Teachers

This course was offered for graduate credit in curriculum studies to four graduate students in Bloomington and to four practicing teachers in Crawfordsville, Indiana (approximately 100 miles from Bloomington) one night each week for 10 weeks during the spring semester, 1996. While the course was designed primarily to serve the professional development interests of K-12 teachers, social studies majors enrolled in graduate classes were also allowed to enroll to provide a studio audience for the course. The assumption – it proved to be true – was that none of the Crawfordsville teachers would have had any prior instruction in international studies. Thus, while the course was offered for graduate credit, the content of the course was pitched to fit educated adults who lacked background in the field. It was further assumed, however, that all teachers, regardless of prior training, should understand current world events in order that they can interpret them accurately to their students.

This course was organized so as to help participants better understand the world today and the forces that are shaping the world of the future. The course examined two macro explanations about forces affecting the modern world: 1) A view offered by Samuel P. Huntington that the fundamental source of conflict in the world will not be primarily ideological or primarily economic; the clash of civilizations will dominate global politics; and 2) the view advanced by Benjamin R. Barber in his book Jihad vs. McWorld; the fundamental conflict of our times is consumerist capitalism versus religious and tribal fundamentalism. These are bringing the planet together while simultaneously pulling it apart. After a thorough examination of these perspectives, the students studied four "civilizations" to learn if either the Huntington or Barber thesis proved useful. The four civilizations were China, Russia, Sub-Sahara Africa, and the United States. In addition, the course included material on conflict resolution and media literacy.

Because the course was intended to help teachers provide their students with a global perspective, those enrolled in the course met teachers who are leaders in global education and learned about resources available to strengthen global education in Indiana. They also experienced lessons that could be used in their own classrooms.

As a result of taking this course, it was expected that the participants would:

- Understand better the forces that are shaping the world today;
- Be able to interpret news events according to whether they are examples of a "clash of civilizations" or an example of Jihad vs. McWorld;
- Possess new information about selected parts of the world;
- Be able to use ideas concerning conflict resolution and media literacy in their classes;
- Gain ideas for introducing global education into their own courses.

The course met for two and one-half hours, from 6:30-9:00 P.M. one night each week for nine weeks and one meeting on a Saturday morning. On nearly every occasion, the course originated from Bloomington; on one occasion the instructor drove to Crawfordsville and taught the course from that site. The last class was held in Bloomington with all of the participants present at the Bloomington site.

Students were assigned books and articles to read prior to each session. In order to maintain interest, the sessions emphasized interaction across the two

locations. Students engaged in dialogue with the instructor and classmates, participated in debates, presented reports, observed and reacted to a variety of media, and listened to and responded to guest speakers.

Results. The course was evaluated by an external evaluator, and the results were generally positive. The students asserted they had learned content they would not otherwise have studied, and they indicated ways they could incorporate the material into their course lessons. None of the Crawfordsville teachers would have taken the course if they would have had to attend classes in Bloomington. While they felt that the distance learning technology came close to providing a classroom atmosphere, all appreciated the opportunity for a face-to-face meeting, involving all of the participants, at the last class session.

The main drawbacks were numbers of participants and technology failures. Each site had only four participants. When any student was ill or had to miss class for any reason, it placed a heavy burden on the remaining students and instructor to sustain the dialogue. Eight students were barely enough; more would have been better.

The equipment also presented problems from time to time. The most serious problems occurred because of difficulty in tuning the audio. Scheduling the programs also required the cooperation of several individuals. A more simple di Al up service would have been more convenient.

The course was treated as an experiment. Both instructors and students learned from it and were ready to pursue other distance learning options.

Summary of Videotape

The videotape runs eight minutes. It contains segments that show the Bloomington facility and equipment. It also contains segments from different class sessions in order to convey the nature of the dialogue that took place within and across the two sites.

During the first portion of the tape, the audio is mute, allowing the presenter the opportunity to provide a voice-over description of the scenes. The latter portion of the tape includes audio in order that the listener/viewer can attend to the class discussion.

EXPLORING PRE-SERVICE TEACHERS' KNOWLEDGE AND USE OF COMMUNICATION TECHNOLOGY

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The effective use of technology in handling the global information explosion will be one of the most important skills of future educators. They will need to be able to effectively use technology to communicate, problem-solve, provide instruction, and manage information. Using technology should allow teachers and students to effectively communicate. However, several studies have reported that even though computers are readily available, teachers may not be prepared to actually use them. Fox, Thompson, and Chan (1996) indicate that despite the increased availability of computers, many teachers are not incorporating technology into their lessons on a daily basis because they have not been taught how effectively to use the technology. Future teachers are especially vulnerable because they lack the expertise in using technology including electronic networks. Thomas, Larson, Clift, and Levin (1996) discovered in their three (3) year project that three critical issues must be addressed when integrating technology in teacher education. First, access needs to be established. Teachers cannot use technology if it is not available when they need it. Second, training is needed, not simply a one-time course, but actual modeling on how to incorporate technology in content related assignments. Training should be ongoing and based upon the needs of students and teachers. Third, the social and instructional context must be considered. The context includes the program, the faculty, the school setting, and the practical applications of technology in teaching. These researchers found that prospective teachers needed opportunities to see, use, and implement technology both as a tool and as a teaching tool and resource.

Teacher education programs should incorporate technology in their teacher preparation programs. Beaver (1990) discovered that teacher education faculty lacked the expertise to use technology and as a result, were not prepared to assist their own students with technology. He concluded that teacher preparation programs must expose future teachers to instructional

computing, demonstrate how to integrate technology into classroom instruction, and train faculty members who lack expertise in the instructional use of technology.

The roles of educators in using computers and communication networks in the 21st Century will drastically change. Kook (1997) indicates that computers and communication networks will change how and where education occurs, and suggests that teachers' roles will be transformed to include the following.

Teachers as Information Consultants - Teachers will become on-line professional information-search consultants who help their students access information.

Teachers as Team Collaborators - Teachers will plan curriculum, discuss innovative methods, exchange ideas, discuss solutions to problems, and support one another across geographic regions.

Teachers as Facilitators - Teachers will guide and facilitate students' creative and critical thinking in a collaborative learning environment. The teacher will help students make decisions, establish goals, and take ownership of their own learning.

Teachers as Course Developers - Teachers will continue to plan the overall content and structure of courses, but will need to focus more from a constructivist perspective.

Teachers as Academic Advisors - Teachers will diagnose student academic needs for instruction and graduation, help students to select an appropriate program, review progress, and provide feedback. In essence, the teacher will become a developer, planner, manager, and change agent.

If teachers are to assume the suggested roles above, they will need more experiences in their teacher preparation programs to meet these additional responsibilities. According to Nicaise and Barnes (1996), there is growing need to redesign undergraduate education in order to combine technology, constructivism, and teacher education. These researchers indicate that when students are in student-centered, student-directed, collaborative classrooms supported with teacher scaffolding and authentic tasks, they learn more. They suggest that technology supports construct theory, learning, and teaching. In their undergraduate, secondary mathematics education course, they were able to help future high school math teachers understand and learn how to implement different learning theories, instructional methodologies, tools, and materials.

Technology can serve as a catalyst for student empowerment. Saye (1997) discovered that empowering learning environments with technology gives students choices in their learning and helps them construct personal meaning, improve their problem-solving abilities, and make them more independent decision makers. However, Saye (1997) also discovered that not all teachers are likely to use technology in ways that empower students to be active learners. Teachers believed that technology should be used (a) first, for efficiency because of its time saving and reliability; (b) second, for its enrichment, it helps to provide a more vivid or realistic engagement of the content; (c) third, because it allows for control; it aids in maintaining order and structure; and (d) fourth, because it empowers students and provides a tool for active student learning.

However, not all researchers are willing to accept the impact of computer technology on learning without offering a few concerns. Pepi and Scheurman (1996) indicate that technology needs to be examined carefully because of the tendency in education to gravitate to the latest trend in order to address learning challenges at a cost to the profession and the children it serves.

Also, caution should be taken because of the cost of computer technology. Finally, caution should be taken because the lure of technology makes traditional educational methodologies seem mundane. Pepi and Scheurman (1996) further suggest that before educators embrace the computerization of education that the following questions need to be addressed.

Pepi and Scheurman's Ten (10) Questions

1. Just what do computers offer that those of us involved in elementary and secondary education really need?
2. Are past, current, and anticipated uses of technology consistent with contemporary theories of learning?
3. Is technology an effective catalyst for educational reform?
4. Is using computers synonymous with good teaching?
5. Does technology promote critical thinking?
6. Does technology build cooperation?
7. Does the abstract and efficient nature of computer technology recommend it for a prominent role in educating the young, which is a fundamentally nurturing rather than an exploitive process?

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8. Is the appeal to a future dominated by computer technology a sufficient reason to give computer technology in the public schools?

9. How much computer technology is compatible with the elementary school's responsibility to provide a developmentally appropriate environment?

10. How much information can we tolerate?

Answering these questions should provide a lively debate among educators as to the real role of technology.

In his discussion on "How the Web Destroys the Quality of Student's Research Papers, David Rothenberg (1997) indicates that the use of technology has actually reduced the quality of students' critical thought and original ideas in the papers they submit.

Rothenberg indicates that students are letting the "machine do their work for them," they are not reading carefully, understanding nor synthesizing information from various sources. They are instead reading advertisements for information, turning in work that has numerous spelling and grammatical errors, and not demonstrating that they can critically analyze information. He further suggests that students' attention spans are waning, and their abilities to reason for themselves are declining. Is Rothenberg only seeing an isolated event, or does the new technology actually have limitations as to its effectiveness in learning? This researcher wanted to address some of Rothenberg's concerns. Therefore, a survey was conducted with teacher education majors to explore pre-service teachers' knowledge and use of communication technology.

During the Fall semester, 1997, one hundred and seventy-two (172) pre-service teachers enrolled in a Midwestern university in the United States were queried to determine their use of technology and its effectiveness in helping them with their literacy and researching abilities.

Questions were based upon findings in the literature which suggested that technology might be useful in teacher education.

Students were asked about the following: (a) their use of the computer in writing assignments, (b) their writing ability using technology, (c) their use of computers to conduct research, (d) their use of the World Wide Web in reading and analyzing information, (e) their use of the Internet in reading and analyzing information, (f) their use of technology in becoming more critical

readers, (g) their use of technology in analyzing and synthesizing information, (h) their use of technology in synthesizing information from various sources, (i) their use of the Web to learn new information, and (j) their preparation in teaching children to use technology effectively.

Students read each of ten (10) statements, then decided whether to respond yes, somewhat, or no to indicate their preferences. Responses were analyzed and percentages computed indicating total preferences.

In addition, students were encouraged to make comments on improving their own use of technology.

Table One: Use of Computers		
Use of computer made written assignments easier.		
YES	SOMEWHAT	NO
91%	7%	2%

Students were overwhelming in agreement that using the computer made completing their assignments easier. The use of technology has allowed students to make their work load easier. Schnackenberg and Savenye (1997) indicated that pre-service teachers have very high expectations for using computers.

Table Two: Computers Improving Writing		
Use of computer improved writing ability.		
YES	SOMEWHAT	NO
47%	30%	23%

Very few students (23%) felt that the computer had not improved their writing. The majority felt that the computer had to some extent improved their writing abilities. Holland (1996) and Rankin (1997) contend that technology can be used to improve students' writing abilities. However, these researchers do indicate that students need to understand the writing process in order to use technology effectively. Stephen Marcus (1995) cautions that one cannot assume that the use of technology is going to motivate students or improve their writing. He suggests that students may prefer using the computer, but the actual quality of their work depends more on good teaching than on rapid

reformatting and high resolution printing. Marcus (1995) goes on to remark that it is teaching, not technology, that makes the difference in improving students' writing. Teaching students how to write well, not teaching them to use the technology is the basis for the Rothenberg (1997) comment, "I need to teach students how to read, to take time with language and ideas, to work through arguments, to synthesize disparate sources to come up with original thought." (pg. A44).

Table Three: WEB improving Research		
Use of the World Wide Web Improved Research Ability		
YES	SOMEWHAT	NO
40%	37%	23%

Unlike Rothenberg's claim that the Web destroys students' research abilities, most of the respondents claimed that the Web did improve, or improve somewhat, their research abilities. Starr (1997) maintains that the development of the Internet has started a revolution in communication by providing numerous opportunities for delivering instruction. Starr indicates that there is a need to dispel some of the confusion surrounding the Internet and the World Wide Web. The Internet is a collection of networks, computer lines, telephone lines, and satellite links. The World Wide Web is one of several services found on the Internet. According to Schrum and Berenfeld (1997), in 1996, the Internet connected almost five thousand (5,000) networks. The Web enables information to be interconnected and easily accessible. This technology allows multimedia documents to be viewed easily. Quinlan (1997) acknowledges that the World Wide Web is different from other Internet applications because it encompasses not only text, but hypertext, graphics, sound, and video. This might indicate why pre-service teachers believe that it is useful in helping them conduct research.

Table Four: Reading and Analyzing with the Web		
Use of the WEB improved reading and analyzing.		
YES	SOMEWHAT	NO
16%	37%	47%

Pre-service teachers did not believe that use of the WEB improved their abilities to read and analyze information. Barnard (1997) suggests that having too much information without being able to organize it, can be frustrating for the learner.

Table Five: Reading and Analyzing with the Internet		
Use of the Internet improved reading and analyzing.		
YES	SOMEWHAT	NO
15%	40%	45%

Pre-service teachers did not believe that their reading and analyzing of information was improved through the use of the Internet. Barnard (1997) indicates that the Internet offers the opportunity to interact on a global basis on any topic; however, users need to receive instruction on how to effectively use this resource. They must be able to decipher useful from useless information in their searches.

Table Six: Computers and Critical Reading		
Use of technology makes you a more critical reader.		
YES	SOMEWHAT	NO
25%	43%	32%

One-fourth (1/4) of the pre-service teachers felt that the use of technology, including the computer, made them critical readers. The majority felt that the technology somewhat helped them critically read information. Rothenberg (1997) indicates that students are not engaging in critical reading using the computers as had been expected. They are engaging in critical reading, when they used books and articles that require careful reading of in-depth commentaries on subjects. Anderson and Lee (1995) found that technology encouraged students to engage in cooperative learning, reflect on their learning, facilitated the sharing of ideas and resources, and suggested that pre-service teachers need to receive appropriate instruction in the use of technology if they are to use it effectively. This reflection, while using the technology, may be what is missing for many pre-service teachers. Rothenberg

(1997) maintains that students need to assess sources to determine their credibility. He suggests that the Web leads to "...an ethereal randomness of thought. Gone are the pathways of logic and passion, the sense of the progress of an argument."

Table Seven: Computer Synthesizing Information		
Use of the technology helps to analyze, synthesize, and understand information.		
YES	SOMEWHAT	NO
32%	42%	26%

About one-fourth (1/4) of the pre-service teachers felt that the use of technology, including the computer, did not help them to analyze, synthesize, and understand information. Most believed that the technology did help them to some extent understand the information. Balli, Wright, and Foster (1997) found that more practical training in teacher education would help pre-service teachers not only in their use of technology during their training, but also when they were placed in an actual school site.

Table Eight: Technology and Original Ideas		
Use of technology synthesizing information from various sources helped with original ideas when researching and writing.		
YES	SOMEWHAT	NO
41%	47%	12%

Pre-service teachers did perceive that the use of technology helped them in synthesizing information from various sources, and they could come up with original ideas when researching and writing about topics. This investigation did not examine students' actual research papers to determine if original ideas were presented. According to Rothenberg (1997), the shortcuts that the Web makes for students to search various locations for resources in many cases leads to fragmented and superficial arguments.

Table Nine: WEB Improved Learning		
Use of technology including the WEB improved ability to learn new information.		
YES	SOMEWHAT	NO
54%	34%	12%

More than half (54%) of the pre-service teachers believed that the technology has improved their abilities to learn new information. Siegel, Good, and Moore (1996) discovered that exposure to technology actually improves pre-service teachers' attitudes toward computers, computers were found to be stimulating in learning, and that pre-service teachers expected to work with computers when they entered their own classroom.

Table Ten: Preparation to Use Technology		
Prepared to use effectively technology including computers in their own classrooms.		
YES	SOMEWHAT	NO
41%	43%	16%

The majority of pre-service teachers believed that they were prepared to use technology including computers in their own classrooms. The Center for Children and Technology (1994) report that eighty-three percent (83%) of experienced technology-using teachers have been teaching ten (10) years or more, compared to only fifty-seven percent (57%) of all U.S. teachers; and of those who used the technology, seventy-nine percent (79%) had a master's degree or beyond, compared to forty-six percent (46%) of the total teacher population. New teachers expect to use the technology , but need to have help, training, time, and access in order to use effectively the technology. Sheffied (1996) determined that pre-service teachers are more experienced with word processing than other applications and needed early experiences with technology in order to use it efficiently.

DISCUSSION:

Pre-service teachers who participated in this study have access to various forms of technology including computers at their university. They can use both the Internet and World Wide Web in conducting their own research and can communicate with several area public schools.

Pre-service teachers in this study also indicated that they wanted additional information, courses, updated software, and more access to computers. They indicated in their comments that they expected to use technology in their own classrooms, but many did not believe that they were up-to-date on many of the newer technologies. In comments made, several expressed concern about their ability to keep up with what was current. According to the pre-service teachers engaged in this study, access alone to the technology did not adequately prepare them. We need to help pre-service teachers prepare by helping them overcome the misconceptions that they have about technology (Musical and Kampmueller, 1996). Both pre-service and in-service teachers need to receive the training, help, and ongoing support to discover how best to use technology in designing curriculum, establishing educational goals, selecting learning activities for students and improving literacy abilities with technology.

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PROMOTING PROFESSIONAL QUALITIES OF TEACHERS AND TEACHER EDUCATORS

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ABSTRACT:

Teaching is essentially about decision making. Teacher education is about raising awareness of the complexity of teaching and of the processes for gathering evidence on which teaching decisions are made. This paper describes the rationale, development, and use of an interactive multimedia resource which use case methods to facilitate the study of teaching. The underlying principle is that the presentation of classroom exemplars can promote discussion and consideration of various perspectives on teaching. It is this discussion which becomes the stimulus for consideration of both the complexity of, and alternate perspectives on, teaching.

Career long learning and teacher development

Learning to play and enjoy a musical instrument is a multidimensional task. Certainly we need to learn to play, and even to read the notes. But music is much more than just the notes. We need to learn about meanings, expression, flow, and even history, to play effectively. Even listening to music requires some of these higher order orientations. So it is with teaching. There are no doubt basic competencies which can be articulated about teaching. Nevertheless, as with music, there is much more.

Consider your favourite teacher. Was that person merely a skilled technician? Perhaps your favourite teacher embodied a mix of a range of skills, competencies, and orientations which together combined to make the person memorable.

We suspect that the archetype highly effective teacher is some mix of characteristics including personal and leadership qualities, high level of communication skills, creativity, ability to stimulate thinking in students, predisposition to allowing them to take responsibility for their own learning,

ability to relate to students individually, knowledgeable and even passionate about their subject and other subjects as well, and much more. The initial education of such a teacher is much more than the transmission of a narrow range of skills.

Indeed teaching can be considered as a series of competencies, each of which can be extended to include higher-level and complex professional orientations. For example, teaching is ... :

not just	performing routines	but	making decisions
not just	supervising students	but	facilitating learning
not just	managing classes	but	relating to individuals
not just	basic competencies	but	teaching orientations
not just	compelling learning	but	stimulating motivation
not just	ensuring completion of set work	but	stimulating comprehension of key concepts

Neither can these orientations be acted out in isolation- performance in one area impinges on others. For instance, we make decisions about how to motivate a class, which in turn can facilitate the learning of individuals.

Teacher education, both initial and in-service, must both acknowledge this complexity of teaching, and allow teachers opportunities to explore the multidimensionality of the task. Teacher education must incorporate the full range of skills, competencies, and orientations to be optimally effective. This helps to explain why we prefer to see the various phases in the development of teachers as education rather than training.

One approach which the authors have used successfully to address these broader aspects of teacher education is to encourage teachers to examine, explore, and discuss classroom dilemmas.

Classroom dilemmas

Teachers face dilemmas constantly: whether to seek to reproduce society or to transform it, to foster specific objectives or broad goals, to present knowledge as universal or culturally determined, to privilege communication or allow it to be free, to develop confidence or to provoke challenge, to stimulate group processes or foster individual development, and so on.

It is appropriate that the word dilemma has two meanings: one refers to an argument with two alternatives, each conclusive against an opponent; the other refers to a difficult choice. Both meanings apply to teaching. In teaching there are few "right" answers. Teachers need to evaluate options, considering

context, student background, timing, and ultimately make informed choices based on this evidence.

These teaching choices are not so much about which poles of the dilemmas to emphasise, or even about determining which poles are compatible with conventional wisdom, but are about how to use the dilemmas themselves to strengthen both curriculum and pedagogy. For example, while educators have, at times, argued that teachers should emphasise learning processes rather than specific content outcomes (Newton, 1988), foster intrinsic rather than extrinsic motivation (McCombs & Pope, 1994), and deep rather than surface learning (Laurrillard, 1997), we suggest that it is better that teachers become conscious of such choices, and be able make decisions based on the available evidence and local conditions. Rather than seeing choices as dichotomous, teachers can become aware of the continuo associated with each dilemma and move along these strategically, according to factors operating at particular times (c.f. Berlak & Berlak, 1981). In this sense, knowledge about teaching is not so much about knowing which choices are correct, but more about awareness of possibilities and decision making.

Using case methods and information technology in teacher education

A key issue then is to find methods which foster awareness of, and interest in, these classroom dilemmas. Indeed this perspective on teaching needs also to inform our perspective on teacher education. Our assumptions on the meaning of teacher education are central to the approaches we take, and the types of support we provide.

A suitable metaphor can be borrowed from the environmental science educators who contrast an orientation of education about the environment with that of education in the environment (Queensland Board of Teacher Registration, 1993). The similar notion for teaching is that there are some aspects of teaching for which education about teaching is appropriate. Yet there are other aspects for which education in teaching is more appropriate. In other words, at least some aspects of teaching need to be contextualised. This does not necessarily mean that this must be all conducted in schools. Certainly quality experience is a key element. Yet if teacher education students have not developed such orientations to teaching, then unreflective experience in schools may not be optimally productive. The context can be established in other ways.

One established approach to education in the profession is case methods—the study, analysis and reflection on particular incidents or examples of teaching (e.g. Barnett, 1991). Merseth and Lacey (1993) suggest that case methods can develop skills of critical analysis and problem solving, represent the complexity of practical situations, foster multiple perspectives and levels of analysis, and offer students opportunities to engage directly in their own education.

The consideration of dilemmas has become a central principle in our use of technology to provide case study material for education in the profession. Electronic technologies have provided us with new tools for making professionals aware of problematic situations in all levels of education. Our research over the past five years has centred on the development of computer based resources that facilitate detailed investigation of classroom dilemmas.

As an aside, this issue is also central to a consideration of both teacher change and reflective teaching. A key aspect that is not often reported in studies of educational change relates to the initial impetus and motivation for change. In essence, this is about ownership of change. We generally expect that improved teaching will result from reflection on practice, but while reflection is a necessary condition for on-going development and change (Schön, 1983), it seems that it is not sufficient. We have plentiful evidence around us of intelligent reflective teachers repeating inadequate practice over and over without even contemplating the necessity for, or the desirability of, change. While, on one hand, it is clear that reflective practice cannot be mandated, and change cannot be imposed externally without significant angst, on the other hand it appears that change is more likely to occur when there is an external stimulus. Unless personal constructs are challenged, teachers are less likely to see any need for change. The study of cases, and the discussion in small groups and sharing of perspectives, can provide this necessary stimulus for both reflection and change.

Teacher education for an interconnected world

It is relevant for this audience to mention an aspect of this approach which has significant implications for assisting in the development of shared understandings between groups, including where the participants are from different cultures and backgrounds.

One of the key characteristics of the use of case methods is the discussion which allows sharing of perspectives, and exploring alternate interpretations of

particular events. This approach is ideally suited to teacher education in cross cultural contexts, and for discussing teaching across international boundaries.

There has been considerable attention to cross cultural studies of teaching (Stigler & Stevenson, 1991), including those which seek to examine the success of students in Asian countries in international assessments (see Locan, Ford & Greenwood, 1996). Prof Cheng Kai-ming (1995) sought to compare views and values on education in Hong Kong with those from Western countries. Cheng argued that since education is social it is therefore culturally determined. The following table presents an interpretation of Cheng's assertions about Chinese education, and compares it with my inferences about Australian education. One column is left free for readers to complete for their own cultural context.

Table 1: Comparing educational characteristics between countries

Characteristic	Hong Kong	Australia[2]	Your country
Purpose of education	Education is for the good of society	Education is for the development of individuals	
Social mobility	Hierarchical society with mobility through education	Relatively classless society, with education as a filter, providing access to professions	
Role of parents	Parent/teacher partnership - working together for the education of the children	Parents have some involvement in school policy, but not always supportive of teachers	
Expectations of children	Children expected to learn	Society often expects the teacher to interest the students and to stimulate their learning	
Motivation	A mix of intrinsic and extrinsic motivation is valued	Predominantly intrinsic motivation valued, but examinations at secondary level	
Attribution	Effort is considered more important than ability	Children, and society, attribute success more to ability than effort. Academic achievements not necessarily valued.	

[2]Such lists need to be read with considerable care. Within Australia there is very wide variation in beliefs about each of these categories, as no doubt there is in Hong Kong, and your own country.

Of course, we are not interested in emphasising differences: we are though interested in learning from each other. Discussion of exemplars, and sharing of interpretations of implications and actions, can facilitate exchanges which can lead to better understanding of our various perspectives.

Development of a technology based resource

The following is a discussion of an example of a resource which was developed to utilise the potential of interactive multimedia in presenting cases and creating opportunities for discussion in which perspectives can be shared.

The resource, *Learning About Teaching*, was a product of a research project that identified the need to use real contexts to facilitate the analysis of teaching (see Mousley, Sullivan & Clements, 1991). Prior to the development of the resource, the project developed a framework for describing elements of quality teaching. It used analysis of recent literature and a survey of 200 practitioners, teacher educators and other education professionals from several countries (Sullivan & Mousley, 1994a) to identify these components. The results of this research are described in Sullivan and Mousley (1994b). In summary the components can be described as follows:

Building understanding refers to a role which the teacher assumes in order to convey some pre-determined meaning to students. It is a recognition of particular understandings to be developed, and of strategies to achieve these ends by building on existing knowledge, using materials to explain and clarify concepts, choosing appropriate sequences, helping students to make connections, forming relationships, and knowing the meaning of terms. There is a strong inference of teacher decision, teacher direction, teacher explanations and teacher control.

Communicating relates to opportunities for talking, explaining, describing, listening, asking, clarifying, sharing, writing, reporting, and recording. It includes class organisation structures such as co-operative groups, and is characterised by an orientation of teacher and students to accepting communication as a two-way process.

Engaging refers to facilitating student involvement in their own learning. It includes engaging students in mathematical activities, and motivating students to learn. Teachers choose content and materials which are personally relevant for the students or based on re Al world situations, and seek to make learning enjoyable.

Problem solving is when students work out for themselves how to

perform mathematical tasks in such a way that it is the students' own work and they know that it is. It refers to activities such as risk-taking, challenging, exploring, investigating, thinking, asking, and posing.

Nurturing refers to the establishment of a relationship between the teacher and pupils. Teachers do not seek just to teach mathematics but to teach students. While no doubt teachers of mathematics endeavour to cater for the range of abilities in their class and to develop rapport with their students, nevertheless this is more a recognition that teaching and learning is a two-way process and that there is something natural in the expert/novice relationship which includes a nurturing component.

Organising for learning describes comments related to decisions made by the teacher about a specific focus for what would happen in the lesson and a commitment to pursuing that focus and to communicating the focus to the students.

Full lessons that exemplified the components of quality teaching identified were planned, then taught and videotaped. The lesson chosen as the basis of this particular resource focused on mathematics. The teacher posed an open-ended problem which was set in a practical context. The students explored the problem context in groups, then shared their findings with the class. There was a worksheet to extend the ideas from the lesson.

The videotapes were examined using several techniques, including a qualitative analysis of unstructured reviews of the lessons by over 30 experienced teacher educators (see Mousley, Sullivan, & Gervasoni, 1994). Along with other relevant data and readings, they were digitised. An interactive multimedia computer environment was authored to provide flexible access to all aspects of the lessons and to make links between related aspects of the resource.

Use of technology to stimulate education in teaching

The decision to use multimedia was made because of its capacity to show many facets of the professional context. Classrooms are multidimensional and the daily world of the teacher is a capricious one, but multimedia can give users access to minute features of classroom interaction as well as control over the use of different constructs. We support the claims of Merseth and Lacey (1993) that it has potential for introducing the complexity of pedagogy to novices and experienced teachers alike, and that the non linear capability of multimedia allows the use of multiple perspectives and opportunities to review situations.

To capture some of this complexity, the Learning About Teaching resource links the videotape of a lesson to other video records such as pre- and post-lesson interviews with the teachers, procedural documents and readings associated with the lessons, graphic representations of data, a full transcript, etc. This forms an extensive information bank that can be accessed in flexible ways to support detailed analysis of the classroom interaction. Indexing allows scenarios to be examined in conjunction with other data, enabling users to focus on specific teaching skills, moments of interaction, selected sets of incidents, sequences of events, links between theory and the pedagogical action presented, particular students' work, and so on. Uses can explore the options by following menus and selecting options.

The advantage of using compact disk technology is that it is possible to move very quickly to different parts of the video, and by using menus, to view sets of similar excerpts of video. This both increases the independence of the teacher education students and allows the study of a broad range of aspects of teaching. Its flexibility makes it suitable to autonomous learning as well as for conventional lecture/tutorial contexts.

The variety of data available for use is perhaps best illustrated by means of an example. Suppose that a group of teacher education students (undergraduate or postgraduate) wishes to use *Learning About Teaching* to explore "patterns of communication" in a lesson. These users can choose to examine:

- the teacher outlining her aims for the lesson, including her intention to have the children share their developing understandings,
- patterns of verbal and non-verbal communication across an entire one-hour lesson,
- individual interactions between the teacher and each pupil (as well as with the class and with small groups),
- discussions between children as they investigate a problem,
- questions asked by each pupil of the teacher and of each other,
- a transcript of the lesson (with the ability to cross to the video at any point to check inflection and non-verbal aspects, etc.),
- children reporting back to the class what their groups had done and what they had learned,
- some recent journal articles about types of communication in classrooms,
- some specially written papers about specific aspects of communication (such as types of questions),

- some articles about certain purposes for classroom communication (such as engaging children in higher-level thinking),
- the teacher's responses to particular students' comments and questions,
- graphed data about aspects of communication,
- a map of the classroom (with the ability to click on a group of desks to view the children's interactions), and
- the teacher talking after the lesson about how students' contributions were the subject of formative evaluation.

Besides Communicating, the program in a similar way facilitates detailed explorations of Building understanding, Engaging learners, Nurturing the children, Problem solving and investigations, and Organising for learning. However, many other topics could also be explored.

Using dilemmas as the basis of the study of teaching

A key feature of the resource is the extent to which it raises problematic teaching situations that allow users to become aware that there are dilemmas to be considered. The basic proposition which underlies the resource is that the study of particular exemplars of quality practice can stimulate reflection on, and discussion of, key components of teaching. It is expected that groups of users will investigate and discuss focus questions that aim to draw out varied pedagogical beliefs and to stimulate sensitive responses.

The questions generally focus attention on particular aspects of the lesson where teacher decision-making can be involved, and are intended to provide a stimulus for deeper reflection on problematic aspects of the task of teaching. The following are some examples of focus questions that appear in different sections of the resource:

Numbers of questions

The teacher asked about 60 questions. Should she take steps to reduce the proportion of her questions and increase the proportion of pupil questions? If so, what steps could be taken?

A mathematical concept

Daniel claims there is a fourth dimension. What are your ideas on this concept? Is this an idea that the teacher could have taken further at this stage? Find out how some other people would react to this classroom incident. How could you explore this concept with older children?

A particular student

Some people who write about good teaching practices claim that questions should be directed to quieter and reluctant students. Others argue that if these children are listening attentively such a strategy can be counter-productive. Note Gabrielle's interactions and how she engages with the lesson content. What strategies can be used to encourage full engagement?

The focus questions address a wide range of teaching dilemmas. Users interact both with the resource and each other in ways which can create a sense of control over both the aspects of teaching which are studied and the mode in which they are studied. The presentation of dilemmas in the form of questions linked to various aspects of the resource allows students significant control over the focus of their interactions.

The discussion which arises from the consideration of dilemmas has a two-fold effect. First, it allows teacher education students to articulate their own thinking about teaching. This can in some ways be an opportunity to explore hidden assumptions and preliminary experiences, and perhaps to consider these in new ways. Second, it allows teacher education students to hear varied perspectives and interpretations on a particular event. Rather than seeing events as unproblematical, students will find that a range of interpretations of particular events are possible. This helps to introduce them to the complexity of teaching.

Note that the use of such a resource creates some difficulties for teacher educators who have fixed views of the content of their courses. While it is possible to use such a resource to illustrate specific points or to stimulate particular discussions in tutorial groups, for example, its power is in the breadth of choices it provides. Because of the flexibility, students will study and discuss a broad range of topics. It is possible that the topics considered could not be predicted beforehand. This means that there needs to be a different view of what constitutes the content of the teacher education curriculum. Indeed, we would argues that the content is the creation of awareness of the dilemmas.

Using the resource to provoke reflection and discussion

The resource has been used with groups of teacher education students in a number of universities. Generally students have interacted with the resource in fairly autonomous small groups, for up to 20 hours. The aims of such activity include close analysis and discussion of the lesson, linking of theory and practice, and stimulating learning about practice through reflection on practice.

Data on teacher education students' use of, and learning from, the resource have been collected through structured survey items, the writing of lesson critiques, responses to formulated scenarios, unstructured interview items, observation of students' interactions with each other and with the program as they worked, journals maintained throughout the process, and reflective essays written after the completion of the program. In particular we have been interested to find out:

- how the resource has been used;
- whether this use of technology promoted improved observational skills and understandings of processes involved in teaching and learning;
- whether the use of the resource promoted reflection, discussion and writing by groups of teacher education students; and
- whether students became actively involved in the consideration of teaching dilemmas and implications for classroom action.

The results of such research have been reported in Mousley and Sullivan (1997). In summary, teacher education students' unprompted journal entries and interview responses frequently indicated that the flexibility offered by the mode of learning was appreciated, and that the resource provided rich source material for intense, thought-provoking discussions and investigations.

Conclusion

Teaching is about choices. Teacher education must include the development of awareness of the need to make choices, and consciousness of issues relevant to enhancing the quality of the choices made. This can best be done in the context of teaching. Interactive multimedia and other forms of information technology enhance our potential to present classroom based teacher education resources to prospective teachers.

We have argued that creating opportunities for students to study classroom exemplars with their peers facilitates discussion of, and thinking about, teaching. The discussion has the advantage both of raising awareness of alternate perspectives as well as helping to develop the language needed to communicate on an analytical and reflective level about teaching.

We have not extensively explored how these discussions can be extended using communications technology currently available but there is no doubt potential there.

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Improving the Quality of Teacher Education through Curriculum Development

Mathematics via Distance Learning

Peter R. Christopher

Introduction

An outside observer at an international conference dedicated to "promoting teacher education for an interconnected world" might view the event as a kind of trade show, a marketplace of ideas. Simplistically, among the participants there are merchants and entrepreneurs with something to sell - a methodology, a product – and there are consumers shopping for the latest educational trends, pedagogical models and technological tools. Of course, the aim of this exchange transcends mere profit-making, inspired instead by altruistic motives of improving instructional quality and increasing accessibility to education. From a less idealistic level one can see the unpredictability of market forces in education introducing an element of competition, of tension and possibly anxiety. Current educational trends may signify a potential threat to the interests of some universities and perhaps to the economic and cultural interests of some countries. The interconnected world of the next millenium will certainly present opportunities upon which some are likely to capitalize, and it will present risks that others hope to be able to survive. For altruistic reasons, or for self-preservation, all the nations represented, large or small, developing or developed, have a stake in this marketplace.

This paper explores the potential for using distance learning technologies to provide continuing education to pre-college mathematics teachers. Although the ultimate aim of this technological application is the promotion of the common good, questions arise about opportunities and risks for both providers and recipients. These matters are considered from the author's perspective, that of a mathematics professor from a small technological university in the United States. Hopefully, the notions presented carry over to other disciplines and to education in other geographic regions. Although the author's individual experiences with distance learning and with graduate programs for teachers are reflected here, the issues raised are transferable to more general situations.

Distance Learning in the United States

One measure of the growth of electronic learning opportunities in North

America is the current listing of more than 700 such programs offered in accredited institutions, compared with less than 100 such programs in 1993. At the dawn of the twenty-first century one would expect the United States to be emerging as the world leader in designing and providing distance learning opportunities. The high quality of universities in the United States is uncontested, as witnessed by the attraction to these universities of hundreds of thousands of students and scholars from around the world. But the advent of new information technologies introduces another variable – the prospect of international competition in the education marketplace. Distance education is not limited by national boundaries, and, after an initial capital investment, production costs are diminished by reaching wide audiences, so that the competition does not have to be restricted to major players. The notion of 'mega-universities' described by Sir John Daniel, Vice-Chancellor of the United Kingdom's Open University, may well characterize where a large segment of education is heading. In terms of numbers of students, the Open University leads the way with 150,000 students; and there are a few other mega-universities, based mainly in developing countries, with over 100,000 students each. The United States has some large interstate collaboratives, such as Western Governor's University, but does not have a true mega-university at this time. In part, this can be explained by concerns over accreditation issues related to educational quality, but also it must be realized that educational policies in the United States vary widely and are not centralized at the federal level. Most likely it will be capitalistic forces that will drive the movement to wholesale distance learning in the United States.

On its way to becoming a mega-university is the National Technological University (NTU), a cooperative of 48 universities linked by satellite to more than 1000 work locations internationally. NTU offers 14 masters programs (no bachelor's degrees); its non-credit short courses have an enrollment exceeding 110,000 students. Also, not waiting for an expanded role of state universities, many private universities are becoming serious about distance learning. Prestigious institutions such as Stanford, Cornell and Johns Hopkins offer specialized degree programs or aim to export courses to the potentially lucrative international market. Small complacent universities may find themselves in an unenviable position, not unlike that of small grocers who have become extinct with the advent of wholesale chains.

The WPI Experience - A Case Study

A technological university in Massachusetts, Worcester Polytechnic Institute

(WPI), should be in a position to withstand the pressures, if not become a player in the increasingly competitive arena of providers of distance learning programs. Founded in 1865, WPI is the third oldest private university of science and engineering in the United States. Although it is a relatively small institution (approximately 2800 undergraduates, plus 1000 graduate students), WPI has earned widespread recognition because of its innovative project-based academic programs. For example, during the past twenty-seven years WPI has required that its undergraduates devote a minimum of one-fourth of their academic activity to a series of three in-depth projects: one related to the humanities, a project that relates technology to society, and a research project in the student's major area of study. Many of these projects are completed at WPI's project centers throughout the world, reflecting the institution's commitment to, and leadership in, globalization efforts. Students working on realistic applications in project teams, averaging three students per team, develop leadership and communication skills under close guidance of faculty members.

Project-based education is very labor intensive in terms of faculty time, and consequently very expensive. Another factor contributing to WPI's costly operation has been the heavy computerization of the campus and investments in related technological activities, including distance learning.

Since 1979, with the creation of the Advanced Distance Learning Network (ADLN) at WPI, distance courses have been originating from the university's studio classrooms via videotapes and more recently using live video conferencing. Communication between students and faculty involves interchanging materials by express mail, fax, electronic mail or telephone. Currently ADLN offers a Master of Business Administration degree and a Master of Science degree in Fire Protection Engineering. The latter program has students in Canada and England and is expanding to Thailand.

But undergraduate distance education at WPI is a different story. To help understand why WPI is not yet paving the way in that area, the author relates a sequence of events that transpired there during the recent introduction of undergraduate courses in the distance learning format. The reason for including this episode here is to highlight the transitional status of distance learning and to raise fundamental questions about its potential impact on education. The issues considered are not just those facing an isolated institution, but are shared universally.

Distance Learning – An Individual Experience

The author's exposure to the practice of distance learning has been admittedly recent and modest, but it has served as an eye-opener of the potential impact of technology on education's future. A first effort, which provided the instructor on-the-job training, was the delivery of an introductory calculus course using PictureTel video-conferencing to a group of five students at a single remote site. The second experience involved delivering a calculus course to eighteen students at five different remote sites. The students were adults employed at branches of a major techncompany that offered them the opportunity to pursue a bachelor of science degree in manufacturing engineering.

Classes were con lucted from a modern, cavernous WPI studio classroom. Cameras, operated remotely from an adjacent control room, focused either on what I was writing or on me, when I was doing more talking than writing. Two large-screen television monitors showed the studio picture, so that at times I had the pleasure of looking at myself while presenting, or they showed the students at their respective sites. I found it helpful to speak to the monitor at the rear of the room so that I would project my voice. Of course, there was no real need to speak louder, even with students at a distance. Each of the five sites was equipped with a sound control button that enabled students to comment or ask questions at will. Homework assignments and tests were transmitted by fax or overnight mail.

The most striking aspect of this experience, from the instructor's point of view, was that in many respects it all seemed ordinary and normal. That is, in spite of the obvious differences between teaching at a distance and traditional teaching, my impression at the end was that the distance learning classes were just as effective in terms of delivery. Granted, sitting alone in an empty room and speaking to a television monitor is awkward until one becomes absorbed in the business at hand, namely communicating ideas. Perhaps because these students were adult learners, they were more assertive than typical undergraduates about communicating with the instructor, in this case by written correspondence, telephone, fax or e-mail. Some complications did occur, such as a slight delay of feedback on homework and tests between classes, and the work obligation of some students to travel on business, thereby missing classes. Videotapes of classes were sent to each site for those who wanted to review with the luxury of pressing a pause button. The course was intense -four hours of class time per week over a period of eight weeks. Student evaluations of the

instruction also seemed typical, with hardly any complaints about the distance learning format. Since, in addition to working forty hours per week, these students simultaneously took a second course (in the history of science), their main complaint was, predictably and justifiably, the heavy workload. Yet they were eager to continue with the next round of courses.

Instructors, as well a students, had something to say about their workload, claiming that the amount of effort in teaching a distance learning course is initially twice (some say three times) that of the same traditional course. In the steady state an estimated minimum of three-halves the effort is required for a repeated course. What accounts for this extra effort? Perhaps it is a psychological matter, a belief that time spent over the airwaves is more precious than that spent in a traditional classroom environment, or the fear that mistakes made while on television are more damaging and permanent. For whatever reason, we tend to over-prepare. Also, managing five sites is more work than managing one.

In a just world, the extra effort required of faculty would result in extra compensation or an adjustment in workload. There are many additional expenses associated with operating a distance learning program, which are especially noticeable in small institutions that do not benefit from economy of large-scale production. Facilities, equipment, software, air-time, and personnel enter into the total cost picture of any media center of this type. Having a site coordinator at each of the remote sites is helpful, particularly during examination times, but this adds to the expense. Having a qualified technician at the media center to take care of camera and sound details is essential.

Meanwhile, the WPI faculty had begun to notice that distance learning was creeping into its undergraduate education, which in itself was not troublesome to an academic institution that thrived on curricula innovation and experimentation. In fact many WPI undergraduate courses rely heavily on Web-based instruction, and a few have been designed to be lecture-free, asynchronous and totally centered around the computer. WPI graduate programs conducted by distance learning are successfully functioning and totally acceptable. But the possibility of a distance learning program leading to an undergraduate degree bearing WPI's name raised questions and eyebrows. At the heart of the matter was the very meaning of the degree. Could WPI's rich project-based program lend itself to the distance learning format? Would the result be a watering down of quality, jeopardizing WPI's respectability? What would be the reaction of on-campus students? How do we provide

support services - academic advising, tutoring, access to libraries, athletic and health facilities - to students at a distance? Should there be a minimum residency requirement? Is the course load manageable by adults working full-time? Is distance learning cost effective? Also there was the unaskable from the faculty, a question that would pop up only jokingly: Is the beginning of the end of my teaching career as I know it?

An attempt to find answers to these deep and troubling questions led quickly to the standard reaction - the formation of special distance learning sub-committees and steering committees. My recent experience earned me the privilege of serving on more than one of these. After months of inquiry and healthy discussion, the final outcome was that WPI will not at this time be offering an undergraduate degree based totally on the distance learning format. However, continued experimentation with distance education is supported and encouraged.

The WPI experiences with distance education - the doubts, the confusion, the soul-searching - are being shared by other universities throughout the United States and beyond. My personal experience, as well supporting literature, has taught me that distance learning can produce educational outcomes comparable to those of traditional classroom education. It works! But it is reasonable to wonder about the extent to which distance education should permeate undergraduate education. Although there is merit to the argument that the context, the human interaction, is an important part of the education of 18-22 year old undergraduates, this should not be an excuse to ignore distance education. Those individual universities that remain passive or choose not to acknowledge the implications of distance learning may find their futures strongly influenced by others.

Resources for Mathematics Teachers

As much as the United States takes pride in it universities, the country is bewildered and embarrassed by the low rankings internationally of its pre-college students, particularly in science and mathematics. The search goes on for causes (not enough hours in school, too much television) and cures (parental involvement, curricula reform). A recent study in the state of Massachusetts was revealing: one-third of mathematics teachers in that state had bachelor's degrees in fields outside of mathematics; they did not possess even a minor in mathematics. This statistic emphasizes the need for continuing education and graduate programs for mathematics teachers.

Information technology currently is helping mathematics teachers, either by courses and programs to expand their knowledge or by instruction offered directly to pre-college students. Among the more noteworthy distance learning programs in mathematics in the United States is NetMath, a consortium of five universities that deliver Mathematica based courses to distance education sites over the Internet. The five founding schools are: University of Illinois, Ohio State University, University of Pittsburgh, Harvard University,and University of Iowa. In NetMath students take calculus courses using the Internet and the interactive computer text {\em Calculus \& Mathematica}. The program, which began as a means of reaching out to high school students in rural Illinois, has grown to in-college students and adult learners and extends globally to sites in Germany and Australia. Even though students work in an asynchronous learning environment at their own pacer, they do have a form of human contact. Undergraduate mentors are assigned to each student, and contact occured by e-mail, telephone or Internet chats.

The Boston campus of the University of Massachusetts offers college credit to Boston Public School students and in-service training for teachers via video conferencing, cable television and the Internet. The system is expanding, joining the Massachusetts Corporation for Educational Television, thereby having the capacity to reach learners via satellite distribution in twenty-seven states. PictureTel video-conferencing makes possible synchronous classroom learning among the five campuses of the University of Massachusetts, linked by fiber-optic network.

Of the nearly 300 institutions of higher education listed as offering distance learning programs in mathematics in the United States, only about 25 offer graduate credit and most of those are state universities. Math Teacher Link is a web-based program that offers teachers graduate credit at the University of Illinois. Participants in this program are required to create course modules for use in their classrooms. Since the costs of graduate instruction can be prohibitive for teachers, Fort Valley State University in Georgia has come up with a creative method of attracting teachers to mathematics workshops to be offered in 1998 using distance learning. Teachers qualify for the workshop - and for a 1000 dollar stipend! - by recruiting 10-12 students into programs to improve their SAT or CPE scores. Are there ethical considerations in this capitalistic solution?

Distance learning students, particularly in mathematics, often need extra support in terms of resources to help explain concepts or to investigate topics

in further depth. Access to the Internet provides a rich source of help for these students, and indeed for any mathematics students. One Web site (See 5, Bibliography) provides a list of on-line mathematics resources for the distance learner. Included there are sites that offer free downloadable mathematics software; lecture notes for various topics including linear algebra, Fourier transforms and real analysis; and a site known as "Ask Doctor Math" where students can send in questions.

Reaching Out to Teachers

Until recently the author served for a period of eight years as Director of WPI's Master of Mathematics Program, an in-service program for mathematics teachers. Established in 1976, the program has drawn a steady stream of teachers, approximately twenty per class. The focus of the program is graduate level mathematics with some attention to pedagogical matters and to topics that can be brought back to the teachers classrooms. The program, recently modified, used to require the students to take a total of sixteen two-credit courses over a period of four years. Classes met afternoons and evenings on Tuesdays, so that many teachers traveled great distances, as much as eighty miles each way, for 'four years of Tuesdays'. The thought of setting up on-site programs at or near the teachers home base so that they would not have to travel seemed impractical then, but today's technology leads us to reconsider this option. Teachers at remote sites in all corners of the globe may soon have the ability to choose from a wide list of providers of courses in various formats.

This investigation seeks to determine the feasibility of offering a graduate program for mathematics teachers via distance learning. There is a need for continuing education of mathematics teachers. Moreover, some states, Massachusetts among them, require teachers to continue formal training on a regular basis, and this requirement adds to the demand for advanced courses and graduate programs. Some portion of these are likely to be delivered in a variety of distance learning formats.

Although this report has concentrated mainly on synchronous learning environments using live video-conferencing, it may be more practical, because of costs and learning style preferences, to offer some courses in an asynchronous environment. An instructor planning to design an asynchronous learning environment would find the "Learning Space" template to be used with Lotus Notes especially helpful.

Whatever the blend of synchronous and asynchronous technologies that

might go into a master's level programs for mathematics teachers, the availability of such distance learning programs can provide a much needed service. Access to education will provide teachers with the knowledge and skills of which their students will be the ultimate beneficiaries. It remains now to carefully design a distance learning program for teachers and to find a sympathetic sponsor to produce and market it. There is likely to be healthy competition in this endeavor. Will a 'mega-provider' emerge? Is there a niche for smaller universities? The race is on!

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THE EUROPEAN EDUCATION PARTNERSHIP (EEP Ltd)

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Together we can create the desired solutions which can help the Education community to move to the new Technology era and give all teachers and students exactly what they need to prepare the European Youth for a highly skilled job and give them a career opportunity in this very fast moving Information Society.

This Paper is presented to the ICET World Assembly as a case study for a recently launched Public/Private Partnership in Western Europe between Industry and the Education Community.

Topics

1. Background - The need for action
2. Industry, media and Education
3. Objectives of an Education Partnership
4. Composition
5. Structure
6. Membership and funding
7. The founding Members

1. Background - The need for action

Europe's future competitiveness is dependent on Information Age industries. This in turn places a heavy requirement on the Education community to be able to equip our young people with the necessary skill sets for the Information age, not only through formal education but through life-long learning. Europe must make full use of the educational potential of the information society in order to meet the social and economic challenges of the 21st Century. Multimedia, Internet and advances in training offer the opportunity to provide the necessary infrastructure at this optimum point of development.

The EU Commission has drawn up an action plan to encourage the setting up of permanent partnerships between the public and private sectors. Within the Learning in the Information society initiative, there is a call for a non-profit

European Association to be set up between Industry, education and administrators. This proposal is our response to this goal.

2. Industry, Media and Education

Adoption of technology within the classroom requires action on 3 fronts:

Technology - the provision of the right technology at the most affordable price. Technology requirements include Internet access, personal computers but also new devices which are designed specifically to meet the needs of the Education community.

Content - the availability of IT based content which supports the local curriculum. It is important that the desires of local Governments and Education bodies for curriculum are supported and that technology can fit into those structures. At the same time, with appropriate frameworks, there is material which is universal in nature and which can be adopted easily into local requirements. Component environments hold considerable promise in this regard, and coupled with appropriate authoring and indexing capabilities could lead to considerable time and cost savings.

Training - of teachers in the appropriate use of the material. There is extensive research available from the United States and within Europe which points to appropriate ways to proceed in this regard, looking at the changing role of the teacher in the classroom of tomorrow.

Without all three of these areas being addressed, effective progress is impossible. Overall there have now been many initiatives which point the way forward, but greater co-ordination and learning from experiences would result in speedier progress. It is with regard to this area that there remains scope for an Education Task Force to act as an initiator of projects, a coordinator of activities, and as a focal point by which companies involved in the European Education market can pool their resources more effectively to accomplish common goals.

We propose therefore to establish a group of companies who share our desire for action but would appreciate a framework within which to work and co-operate with other companies. The European Education Partnership has now been created and open to all companies actively involved in Education. The aims and constitutions of the partnership are presented on the following pages but we are keen also to hear what other companies would see as imperatives for such an organisation.

3. Objectives of an Education Partnership

3.1 The aim of the EEP will be to accelerate the implementation of the information society in Europe, by means of developing programs and projects and forging public-private partnerships, which coincide with the aims of the European Commission's Learning in the Information Society Action Plan, current priorities being -

- to connect every school and information resource in Europe to networks so they can find the necessary pedagogic tools, contacts and information for their specific needs.
- to provide these educational establishments with the necessary multimedia equipment.
- to create a wide range of educational software for the curriculum.
- to train teachers and lecturers on how to use the new technology in the classroom and at home to perform his tasks
- and to ensure this is done in a fully open standards, cross-platform, environment that enables access by all schools and learners and communication between them.

3.2 The European Education Partnership (EEP) will provide a Europe-wide, inclusive forum for interested companies to develop programs which fit within defined overall objectives. Inclusive means that it would be open to all companies prepared to meet the financial support requirements decided by the organisation.

The EEP will ensure linkage between local initiatives, with EU initiatives and with company-generated initiatives. The EEP would also co-ordinate an industry response and involvement within the EU framework defined as part of the Learning in the Information society initiative. The EEP will also catalyze practical initiatives and coordinate the diffusion of best practices throughout Europe.

3.3 . To meet these goals and objectives, the EEP would do the following:

- Initiate a regular meeting forum where ideas, initiatives and successes can be shared;
- Act as a forum where interested parties can more easily forge joint programs;

- Act as a focal point for the EU and Education authorities to approach for support on projects;
- Act as a think tank of educational issues for Governments and Educational bodies;
- Publish this information within Europe using on-line media technologies and other methods as appropriate;
- Co-operate on initiatives on both European and local levels which communicate the approaches which can be used. e.g. Local conferences which show how technology can be used within the needs of the local curriculum;
- Support a small office which provided input to EU initiatives

4. Composition

4.1 The European Education Partnership is an organisation open to all companies involved in the supply of Information technology, content and training to the Educational community.

As the European Commission is planning to set up a "Foundation" or non-profit European Association, composed of representatives throughout Europe including:

- Industry (network operators, computer manufacturers, software producers and designers, publishers, broadcasters),
- Education (teachers, teacher-trainers, headmasters, university directors),
- Administrators (government, local authorities, educational authorities, civil servants)

The European Education Partnership will cover the Industry component of this non-profit private European Association.

4.2 The European Education Partnership consists of sustaining companies who contribute the bulk of the funding to allow and sustain the work of the group. In addition there are affiliated memberships and advisory members drawn from the ranks of the Education community.

4.3 Target companies/industries for participation in the Education Partnership include the following:

Telecommunication providers (PTT and cable)

Broadcast companies

Computer suppliers

Software developers

Publishers/Media organisations

Technology integration companies

Electronics companies

5. Structure

A formal structure and composition is required to ensure focus on work of the EEP. At the same time, it is not an intention to create a large bureaucracy with no tangible value-add. The following structure has been set forward :

5.1 The EEP is an independent, non-profit making organisation, ultimately controlled by a Board of Directors who have responsibility for ensuring the EEP adheres to its stated aim and is responsive to the needs of the sustaining members. The Board of Directors will be made up of senior staff from sustaining member Companies, voted onto the Board for two year periods and serving as individuals. The Board will include representation from several countries of the EU and the major sectors of industry involved in networking and equipping schools and supplying content or training online.

5.2 The Managing Director of the EEP will initiate and manage EEP activity in response to the wishes of the sustaining members. The full time employee would need to have extensive experience of the Education community and possess high credibility in dealing with senior Government and EU people. The Managing Director and a secretarial assistant will be based in an office in Brussels.

5.3 The Executive Council of 20 members which represents 15 Sustaining Members and 5 Affiliated Members from education & public sector. They will be the steering group of the EEP, responsible to set out the on going activities and future goals of the partnership. The Executive Council should have a good balance of the different kinds of commercially trading organizations (IT, publishing, networks, Media, Training) and affiliated members (Public sector, educationalists etc).The Executive Council also needs to have a good European geographical spread. The Affiliated Members are invited on the Executive Council and will be elected by the Sustaining Members.

6. Membership and funding

The EEP will be funded from subscriptions from sustaining members and affiliate member and the donations and grants that are available from EC, Government or charitable sources to support EEP activity. It may make profits from some activities and may use these to support other activities, within the overall non-profit making framework of its constitution.

Sustaining membership will be open to any company commercially trading and involved in the supply of information and communications technology, content or training to the educational community in Europe. The subscription levels for sustaining membership will relate to total European turnover of the company, in bands, as decided by the Board of directors.

An Affiliate membership will be open to smaller companies, any education, public sector and industry organisations or individuals who subscribe to the aims of the EEP. Affiliated members will not have voting powers and may not have access to some activities.

A. Sustaining Members: The Sustaining Members should be : Organizations trading commercially in Europe (not necessary with profit, but with interest in Education).

Revenue	subscription levels
> 500 MECU	18.0 K ECU
> 400 MECU	14.4 K ECU
> 300 MECU	10.8 K ECU
> 200 MECU	7.2 K ECU
> 100 MECU	3.6 K ECU

B. Affiliated members:

The subscription level should be 250 ECU per year.

- private companies with revenue < 100 M ECU
- public sector companies (e.g. TV broadcasters)
- public sector organizations
- educationalists
- partner organizations

This would provide an annual operating budget of around 350 K ECU. In addition specific projects (e.g. conferences) may require additional funding but

this would be on the basis of opting into the program rather than an obligation to participate.

6. Founding Members

The founding members of the European Education Partnership are :

Apple Computer
Averbode
Belgacom
Cisco
Deutsche Telekom
France Telecom
ICL
Oracle
Portugal Telecom/CET
SchoolSoft
Sun Microsystems

A meeting of future EEP partners will be held in Brussels on November 13th. Many other companies have shown interest in joining the EEP and have already sent in their application.

If you are based in Europe and interested in joining the EEP or would like to have more information on the partnership and its structure please contact :

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PARTNERSHIPS ADVANCING THE LEARNING OF MATHEMATICS AND SCIENCE

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Introduction

The desire to produce and keep teachers of high quality has increased within the past ten years. This is the result of the public's renewed concern about the quality of education which students are receiving. In many parts of the United States of America the large majority of teachers are those that were trained more than twenty years ago. With lifetime certification and tenure, these teachers may not have kept abreast of trends in their areas of expertise. The Massachusetts Educational Reform Legislation of 1993 addressed the need for a higher quality of current teacher graduates and a thorough retraining of all teachers in the elementary and secondary schools. The Legislation provided funds to find ways of improving the teaching and learning of mathematics, science and technology, and other subject areas. This is when collaborative and partnership efforts begun in mathematics and science.

With a generous grant from the Noyce Foundation and later enhanced by funding from the National Science Foundation (OSR-2950033) and federal funds from the U.S. Department of Education under grant number R168A30024, a ten million dollar grant became available to begin a partnership initiative. This collaborative, referred to as Partnerships Advancing the Learning of Mathematics and Science (PALMS), was made up of school districts, higher education, the museums, parent groups, and business and industry. The State was divided into regions of several cities. Change teams at the regional and city levels were established. Fitchburg State College as a higher education partner belonged to a collaborative linking the college with Leominster, Lunenburg, Fitchburg, and the Wachusett Regional School Systems as well as Mount Wachusett Community College and the National Plastic Museum.

As deliberations went on, many partners saw a need to formulate a mathematics, science and technology policy. It was recognized that mathematics and science were central to the vitality of the economy and the

quality of life. These areas of study can also provide tools for problem solving. They offer students of all diverse backgrounds opportunities to embark on adventures that stimulate intellect and imagination. Students must also see the interrelatedness of mathematics and science and their contribution to technological development, as well as understand the impact the subjects have on today's society. This paper presentation will examine the role of Partnerships Advancing the Learning of Mathematics and Science in developing the Massachusetts Mathematics and Science and Technology Curriculum Frameworks and their impact on teacher preparation and development for Educational Reform in Massachusetts.

Mathematics, Science and Technology Policy

Many pressing global and local problems have technological origins. Similarly, technology also will provide the tools for dealing with such problems. Science and mathematics will continue to provide crucial new knowledge to enhance the continuous development and creative use of new technologies. A complete understanding of these relationships is necessary if we are to attain a reasonable capacity for survival and a work level that we may be comfortable with.

Science has always been misrepresented in texts and curricula. Many curricula present science primarily as a body of knowledge, and secondarily as a process for establishing new knowledge. The framework defines science as a method by which we construct rational explanations for events in the natural world that, at first, might seem incomprehensible, but through study and research become predictable. Through the scientific process, re-experimentation is carried out and theories developed.

Project PALMS has led to the preparation of the Mathematics and the Science and Technology frameworks. The basis for the frameworks is the Common Core of Learning which has laid the foundation for Massachusetts educational reform in teaching, learning and assessment. The Common Core of Learning affirms inquiry as central to teaching and learning. Inquiry-based learning, it says, "would help students to become questioners–not just to know the questions" (MDOE, 1995). Thus the frameworks advocate classrooms that stress inquiry, pursuit of questions that connect in important ways to students, lives. The science and technology framework emphasizes that "students participate thoroughly in the activities of scientific investigations and technical design that they become questioners themselves."

Owning the Questions Through Science and Technology

The Framework sets forth the objectives of teaching and learning science and technology in the statements of guiding principles, habits of mind, and content. Asking simple questions is one of the objectives which the frameworks suggests would open students' minds to wonderful and complex ideas. Current research on questioning further stresses that "when students ask questions, they have the opportunities to clarify misconceptions and to fill in details they have missed" (Mellon, et al, 1992). Students in the primary grades in general do not as conceptual questions. Teachers of science at this level do not usually encourage such questioning. Indeed, the number of academic questions generated at any grade level is very small. Questions do help people to explore the world and their environment more.

Teachers should also encourage students to ask questions more because by such student questioning, teachers are better able to assess student learning. The frameworks encourage students to work like scientists do – raising questions, hypothesizing and experimenting to answer the questions. In classrooms that encourage scientific methodology, students are exposed to different ways of gathering data through careful observation, drawing appropriate conclusions, and reflecting on such conclusions. In their reflection, students begin to ask: Why do things happen the way they have happened? What if the procedures are altered? Is it possible to replicate the experiences? and so on and so on. I the process of answering these questions, students begin to come to grips with contradictions, puzzle through paradoxes, evaluate evidence, and search for connections. Thus they are able to deal with the realities of their real world.

The frameworks also emphasize "active participation in projects, investigations, and the design of challenges that allow them to puzzle and search, raise questions, and rethink them" (MDOE, 1995) A guiding principle of the frameworks states that children are naturally curious and eager to make sense out of what they observe. It is true that young children enjoy discovering the texture, size, weight, and color of things. It is this compulsive involvement that makes them take things apart and put them together, and try to figure out how things work.

Children's curiosity also helps them learn the habits, ideas, and values that are shared by their culture about mathematics and science and technology, and their roles as learners. However, schools in Massachusetts have children that come from diverse backgrounds and do not have the same knowledge, skills,

life experiences, or access to resources. Students at the same grade level may have different understandings of the same ideas; they may have different interests; and they may use different strategies to demonstrate their understandings.

Investigation and problem solving are considered central to science and technology education. Learning to investigate and to communicate and interpret the results of investigations is an important goal of scientists, as well as sciencing in the elementary and middle school grades. The frameworks stress the use of variables–manipulated, responding, and controlled variables. Students can demonstrate the processes of science and mathematics through laboratory work, investigations, and projects.

Many teachers, administrators, and parents have been concerned that the emphasison inquiry would compromise the rigor of learning and lessen the importance of the teacher's knowledge and experience. This can be prevented if school districts and teachers make choices about which concepts to study, and teachers guide students' inquiries, decide when and how to intervene, and help students focus on important ideas and concepts. Careful planning by teachers would ensure that students learn science for depth rather than breadth.

Concerning student learning, the frameworks suggest that students learn best in an inclusive environment that acknowledges, respects, and accommodates each learner's background, individuality, and gender. Thus all children in Massachusetts, regardless of culture, background, gender, physical ability or developmental level, should have the opportunity to learn mathematics, and science and technology. For the program to be successful, the curriculum would need to meet students' different interests, motivations, and strategies for learning while holding all students to high expectations and standards for accomplishment.

There is need for society to recognize the contribution that females and members of the minority populations can bring to mathematics and science and technology. This can be accomplished by teaching science and mathematics in the native tongues of students who may be deficient in the use of the English language and providing opportunities for minority students to realize that people of their own backgrounds abound in the fields of mathematics and science and technology.

It is the goal of the Massachusetts frameworks as a whole to emphasize connections between disciplines. There is need to relate science and

technology or mathematics to all disciplines. (There are frameworks in disciplines other than science and technology and mathematics). Making connections enables the teacher to assess how much learning has occurred.

Communication and collaboration are said to be essential to teaching and learning in mathematics and science and technology. The skills necessary to communicate data to others and put information gathered into coherent communication statements are very important to the scientist. Learners need to think critically and reflectively about their work and to discuss their ideas both with peers and with people who have more experience. Collaboration can be between students in the same class or between one class and another or students from other schools, states, or country. Sharing data and information makes it possible for the replication of experimentation procedures.

Habits of Mind

The habits of mind necessary in science and technology include curiosity, open-mindedness balanced with skepticism, a sense of stewardship, and care and respect for evidence, and persistence. Curiosity allows students to explore the natural and technological world; develops students' abilities to ask questions about the natural world; and develop students' abilities to identify problems of human adaptation (Carin, 1997). It should be encouraged and kept alive in Massachusetts' students.

Advances in mathematics, science and technology demands that we be open to new ideas and then examine them critically. The frameworks emphasize the sciencing process whereby students, through technologies, are generating hypotheses and defining what evidence would be needed to support them. Students would need to suspend disbelief as they entertain new ideas and view with suspicion any information not supported by good evidence.

The impact of industrialization and technological advances has greatly affected the quality of human life and the environment. How can teachers help students to begin to appreciate the richness and diversity of the earth's resources and what they can do to protect man and the environment now and in the future.

Content of the Science and Technology Curriculum

Central to the job of the teacher is instruction. In order to accomplish this task, other areas such as human relations skills, knowledge of child development, seeking and obtaining materials, and the knowledge of subject

matter or content are all necessary. The science content defined by the frameworks as core concept consisting of four standards that are broad statements about what students should know and be able to do as learners of science and technology. Each strand reflects the central rationale of the inquiry process and the importance of owning the questions by focusing on essential knowledge, skills, and strategies that students need in order to become scientifically and technologically literate.

The traditional paradigm that calls for "coverage" of material is abrogated and the "less is more" concept adopted. The new view beliefs that there are relatively few "big ideas" in science and mathematics, but thousands of "trial pursuits" teachers must make sure that students do not get bogged down with memorization of the trivia. The impetus for the Massachusetts Frameworks is provided by the development of the Curriculum and Evaluation Standards for School Mathematics by the National Council of Teachers of Mathematics (NCTM, 1989), the National Science Education Standards (NSTA, 1996), and the American Association for the Advancement of Science's Project 2061 (AAAS, 1995).

The PALMS group which took on the primary responsibility for developing the Mathematics and Science and Technology Frameworks looked at content at three different levels. In the early school years, inquiry leads children to engage with the world. They make careful observations and talk about what they see. Later, children are guided through a more quantitative inquiry as they begin to collect, group, and order familiar objects. They are encouraged to look for similarities and differences; talk about any changes observed; and ask more questions.

At the elementary level, concepts, once considered difficult due to the specialized vocabulary are allowed to emerge developmentally. The emphasis is on making the language of science an integral part of a child's education. Using science, which is rich with stimuli, students would be immersed in a literate environment including instructional, informational, and recreational resources. This is also the time when children come to realize that some of the questions can be answered by carrying out a test. They are able to proceed from simple to more complex tests, using specialized instruments and tools. Both tests that seek an understanding of scientific concepts and those that take the form of technology design challenges and searching for workable solutions to simple problems.

At the middle school level, full use is made of the middle school concept

which no longer accepts the notion that middle schools are preparatory schools for high school. Instead, middle schools are viewed as places where young adolescents learn to live and work with each other. As they learn to grow up, they also learn that traditional subject matter are not "cut and dry," they are interdisciplinary and interrelated. Activity-based, theme-based, and research-based teaching and learning are encouraged. Students at this level are able to plan and carry out more sophisticated experiments and to reflect more critically on their conclusions. They are also able to use the sciencing process with greater confidence and can distinguish relevant from irrelevant data.

In the development of the mathematics and science frameworks, it was recognized that the teaching of these subjects in high school offers a serious challenge. In today's public schools in the United States of America, high school turns out to be the place where the majority of students take what is required and bail out of science. Students are only required to take a minimum of mathematics courses. The frameworks emphasize the need for a majority of high school students to become exposed to science and mathematics in an increasingly technological world. Students at this level should not only be performing experiments but be analyzing and interpreting complex data, creating models, making inferences, and using evaluative feedback to check specifications.

A fully implemented K-12 science curriculum would address the science and technology strands of inquiry, domain of science, technology, and science, technology, and human affairs. Each strand includes a narrative description, specific learning standards, and vignettes and examples that illustrate the standards in action. The learning standards are organized by a span of grades and provide specificity with regard to what students should know and be able to do at the end of each grade span (PreK-4, 5-8, 9-10, and 11-12).

The Domain of Science

The purpose of the domains of science is to help students become scientifically and technologically literate. Students need to demonstrate the process of sciencing: knowing and understanding, exploring and discovering, imagining and creating, feeling and valuing, and using and applying. Through sciencing, students are able to understand certain central concepts, laws, and theories that transcend the traditional domains of science (physical sciences, life sciences, and earth and space sciences). The framework states that "through the domains, lifelong learners are able to understand and apply the principles, laws, and fundamental understandings of the natural sciences"

(MDOE, 1996). This would enable them to successfully contribute to a society in which science and technology play an increasingly important part.

Crossing the domains of science is done in two main ways: topic-based approach and the unifying concept approach. In the topic-based approach, science concepts are organized in topics that enable students to perform investigations across the domain of science. For example, students may examine light and atomic energy, wetlands, pollution, and so on. These topics serve as themes by which the teacher can teach the physical sciences, life science, and earth and space science.

The unifying concept approach makes use of concepts and processes common to all the domains of science. Some examples include "patterns and change; constancy, change and measurement; interaction and system; evidence, models and exploration; or evolution and equilibrium" (MDOE, 1996). The framework suggests that students in pre-K through grade 10 be taught all areas of the domains of science. Only when students are in grades 11 through 12 that they be allowed to specialize in specific branches of science such as physics, chemistry, biology, and astronomy.

Technology and Human Affairs

The frameworks see technology as having a close relation with science; both being practices based on inquiry. They also recognize the impact of technology on society as it ask questions like "How does this work? How can this be done?" and "How can this be done better?" Technology may, therefore, be defined as the process of production and delivery of goods and services. "Technological innovation is the process of investigation leading to more effective production and delivery of a significantly modified good or service, or production and delivery of a new good or service" (Harrison, 1988, p.18).

Science proposes explanations for that which is observable, whereas technology proposes solutions for problems of human adaptation to the environment. Technology is hardly treated in textbooks as a topic worthy of study itself. The Science and Technology Framework has deviated from the old paradigm which defined technology as the application of scientific knowledge, which is less than correct. Technology is more than an applied science, and it is more than a method. Current thought views technology as a process whose endpoint is the solution to a problem. Such a solution can take several forms or variables.

Sometimes when people speak of technology, they tend to mean only the use of computers. Computers may be used for calculations, graphing, word

processing, data gathering, and networking with scientists, students, and teachers locally as well as nationally and internationally. While computer technology is useful in the teaching and learning of science and mathematics, other types of technologies such as machinery, scientific tools, and devices that help us solve problems are equally important.

Many scientists and others are becoming increasingly concerned about the societal implications of science and technology. There has been great advances in science in the twentieth century. This has enabled us to see far more deeply than ever before into the nature of matter and life. As we enter the twenty-first century, our technologies have given us the power to alter the environment and at the same time the ability to make wise use of that power. How can our students be prepared to effectively deal with the problems created by science and technology? The frameworks suggest that the school is a place where lifelong learners need to be taught to understand questions and problems of science and technology in the context of human affairs.

Achieving Mathematical Power

A major goal of the framework is for all students to develop mathematical power, a complex process, indeed. In school, the mathematics children learn depends not only on what is taught, but also, on how it is encountered. This means that we cannot separate the content of the curriculum from the instructional practices used to teach it. The strategies used must promote and support students to intellectually engage with important mathematical ideas.

The core concept of the mathematics framework is that students develop mathematical power through problem solving, communication, reasoning, and connections. Problem solving provides opportunities for children to work together and communicate with one another. This allows the use of critical thinking skills as students communicate mathematically, explain their reasoning, and think about their own thinking (Nomishan, 1997). It is no longer tenable to view problem solving as being able to compute and that there is only one way of communicating mathematics: from the teacher to the students.

The designers of the frameworks believe that all students are capable of solving problems and are given the opportunity to solve problems in different ways. Students are asked to develop and use a variety of strategies when solving problems, and use multiple strategies to solve the same problem. The communication paradigm changes to that whereby students learn by means of reflecting of ideas and communicating their thoughts with others.

Project PALMS sees a vision for mathematics classrooms in Massachusetts as pivoting on students constructing their own understanding of the discipline out of activities designed to promote inquiry. The teacher's role is seen as that of being able to select concrete activities that are rich in mathematics and frequently drawing from the students' experiences. The teacher encourages risk-taking, cooperative learning, and the testing and verifying of ideas that emerge from their work among themselves, rather than looking only to the teacher for the final say. This setting provides opportunity for students to learn from each other's explanations and from the process of clarifying their own understanding as their companions question their feelings.

Each activity that the teacher introduces to the class should do at least three things: target important mathematical ideas; promote the connections among mathematical ideas; and uncover relationships between the ideas introduced in the activity and the concepts with which students are already familiar. It is essential that each activity end with careful discussion of the concepts which the students explored and of the relationships uncovered in the process. This permits for clarification of learning and integrating into the students' existing network of ideas; serves as a tool for ongoing evaluation by the teacher; and enables the design of new activities and experiences to test students' false assumptions and conclusions, confirm accurate findings, and extend her students' knowledge.

The mathematical content of the curriculum and of each activity needs to be clearly defined by the teacher before it is introduced to the students. Educators need to avoid the trap of providing students with enjoy a activities which fail to significantly advance students' knowledge of mathematics. It is also important that students not leave mathematical activities with disconnected nodes of knowledge or ideas. Educators must ensure that substantial gaps do not develop in the system of mathematical knowledge which students are developing, but that a rich matrix ideas has been thoroughly explored at the end of each academic year.

The process suggested by the framework is a critical one for the success of a teacher involved in assisting students to explore and discover mathematics. The emphasis is on the essential processes of mathematical inquiry: problem solving, communication, reasoning and establishing connections. At the same time, teachers must remember the importance of delivering to students through these processes a substantial understanding of content of mathematics.

The content of the curriculum presents the mathematics all students should

know and be able to do. The description of content is not described separately from how students are to work with and use the mathematics. It presents vignettes and activities that incorporate strategies with activities that engage students in working on important mathematics.

Earlier it was mentioned that the mathematics and science frameworks recommend an interdisciplinary approach to learning. In the elementary grades, an integrated approach to mathematics might include activities which combine measurement, estimation, geometry. In middle schools and high schools, it will mean helping students make connections between ideas from algebra and geometry, but also among ideas from discrete mathematics, probability, and statistics. There are several reasons why this integrated mathematics curriculum is recommended.

- It will provide students with a more accurate picture of the nature of mathematics and will give them the opportunity to understand the essential connections among various fields within mathematics.
- Students will become more powerful problem solvers if they learn problems can be approached in more than one way. Problems in the world do not come labeled "geometry" or "trigonometry."
- If students are continually encountering ideas from all parts of mathematics, it is likely that less review time will be required, hence there will be more time to teach some of the recommended mathematics topics, such as statistics and probability, which have not been part of the traditional mathematics curriculum for all students.
- Presenting problems which can be solved in more than one way will allow students to rely on either strengths and, simultaneously, develop new abilities. A problem which can be approached either visually of numerically, for example, will be accessible to those students in the class who are visual learners. At the same time, as solutions are shared, they have an opportunity to learn how the problem can be approached numerically. The reverse will be true of students who are more comfortable with numerical approaches and need to develop their visual skills (MDOE, 1996, p. 17).

Mathematics Curriculum Standards

The Curriculum and Evaluation Standards for School Mathematics, developed by the National Council of Teachers of Mathematics (NCTM), represent the consensus of the nation's mathematics education community

about the fundamental content that should be included in the school mathematics school curriculum (NCTM, 1989). Massachusetts, through the work of PALMS, adopts the NCTM Curriculum Standards as the basis for mathematics curriculum in the Commonwealth. These Standards should be used by districts, schools, and teachers as they develop new curriculum specifications.

The NCTM Standards are organized into two clusters. The "Fundamental Process Standards" consists of Mathematics as Problem Solving, Mathematics as Communication, Mathematics as Reasoning, and Mathematical Connections. The framework recommends that these standards be embedded in all the mathematics work students do. They cut across and permeate all topics and all three grade level spans: K-4, 5-8, and 9-12.

The four standards form the backbone of the five educational goals for all students that are specified in the NCTM Standards (NCTM, 1989, pp. 5-6): (1) students learn to value mathematics, (2) students become confident in their ability to do mathematics, (3) students become mathematical problem solvers, (4) students learn to communicate mathematically, and (5) students learn to reason mathematically.

The remaining NCTM Standards are organized into the following clusters of major ideas:

I Number Sense
  A. Number and Number Systems
  B. Estimation and Computation
II Patterns, Relations and Measurement
III Geometry and Measurement
IV Probability and Statistics

It must be noted that no standard uniquely belongs to one and only one cluster. Many standards cut across several clusters. Clustering the standards is intended to show some of the connections among the standards and the continuity of the standards across the grade levels. The Massachusetts Adult Basic Education Math Standards, are an extension of the NCTM Standards to include adult education. Using the cluster, the Framework tries to show connections between topics and across levels. Although the Standards are organized by topic and grade span, in actual practice they will not be taught in isolation, but rather in an integrated fashion.

Assessment in Mathematics, Science and Technology

Assessment in mathematics, science and technology is seen as an opportunity for student learning, a tool for guiding instruction, as well as a way to document student progress. Assessment provides teachers and students with information about students' understandings, skills, and knowledge. When embedded in the learning and teaching process, assessment can offer non-judgmental feedback as well as an opportunity for students to practice skills and apply what they have learned in a new context. Teachers are able to make more informed decisions about their course of instruction.

It is obvious that educational reform in Massachusetts is concerned with improving mathematics, science and technology curriculum and instruction as well as with the quality of teaching and the competence of teachers. Key to the attainment of this goal is effective assessment processes. The National Center for Improving Science Education has suggested three important reasons why assessment is necessary:

1. Assessment can be a helpful tool for the teacher to guide instruction and make it more effective.
2. Assessment can impress on students, school staff, and parents the importance of science learning.
3. Assessment can be used as a policy tool to monitor the outcomes of science instruction and help improve science programs" (Raizen, et al, 1989, p. 3).

According to the National Education Standards (NRC, 1996), assessment must be consistent with the decisions they are designed to inform; achievement and opportunity to learn must be assessed; the technical quality of the data collected is well matched to the decisions and actions taken on the basis of their interpretation; assessment must be free; and the inferences made from assessments about student achievement and opportunity to learn must be sound.

A set of assessment reforms are also outlined in the Assessment Standards for School Mathematics (NCTM, 1989). These Standards are designed for programs. The teacher needs to develop alternative assessment tools to measure "growth in students' understanding of mathematical concepts as well as thinking processes commonly found in elementary and middle school mathematics programs throughout the country" (Sheffield and Cruikshank, 1996). Effective teachers would use such assessments to "gain a sense of children's knowledge and interests so they can plan learning activities to build on these strengths and interests" (Shaw and Blake, 1997).

Assessment supports the teacher's teaching, and not undermine it. However,

expectations about mathematics and science learning, which may come from the public – including parents, school board, and policy makers, may drive assessment. It is type of pressure that has given rise to the mandated testing in 4th and 10th grades. These standardized tests are not universally accepted and may tend to show bias towards girls and minority student populations.

Project PALMS should be concerned with the assessment and evaluation of the quality of the mathematics, and science and technology curriculum. There is need to assess, not only for the attainment of subject matter knowledge and competencies as set out in the curriculum material that is taught but measures of students' conceptual development and process skills. The tools to be used would include performance tasks and portfolios and open-ended questions. Assessment should also require students to respond to writing journals, drawing, manipulating data, and/or applying knowledge to solve problems (Carin, 1997).

There are plans underway to design assessment tools that would be used to obtain information aimed at shedding light on the methods and knowledge gained by students as the Frameworks are being implemented. Use will be made of verbal protocols (Ericsson & Simon, 1984; Nuthall & Lee, 1982) as well as the instrument based on the Concerns-Based Adoption Model (CBAM) developed by Hall and Loucks (1978). Both methods will be used in conjunction with observations and interviews. Other aspects of the curriculum that will be assessed include students' disposition to apply scientific knowledge and skills outside the formal classroom; and practical laboratory skills, science intellectual skills, and generic thinking skills.

Developing and Supporting Teachers

The Massachusetts Educational Reform Law of 1993 recognized the importance of quality teachers for quality learning. It said "we cannot regain our educational edge without good teachers." It is the teacher who determines what is taught, how well it is taught, and the environment in which it is taught. The Law provides for the improvement of teacher preparation programs. Teachers must receive adequate opportunities for professional development and training.

Effective mathematics and science programs depend on teachers and administrators who are enthusiastic, informed, creative, dedicated, provided with adequate resources, and supported to develop a productive professional culture within their schools. Teaching requires ongoing professional development, and teachers need to experience the kind of instruction that they are being asked to provide. In addition, as teachers and administrators attempt

to make these changes, they need to deepen their understanding of mathematics and science, in order to avoid making changes which are not well thought out.

Good professional development programs for science and mathematics incorporate (1) knowledge about science and mathematics, science and mathematics learning, and science and mathematics teaching; (2) strategies that help teachers develop and incorporate that knowledge into their teaching; and (3) structures that involve teachers in decisions about their learning and create an environment in which new knowledge is supported and renewed.

One of the tenets of the Frameworks is that teachers are most effective in designing curriculum and instructional strategies when they make explicit and build their work on the assumption that all students can learn. Similarly, professional development programs will be most effective in their design is consistent with the assumption that teachers want to be successful in their teaching, that they will welcome well designed, appropriate opportunities for learning which will enhance their teaching. this means placing more emphasis on supporting teachers' growth and using their good ideas than on attempting to use professional development activities to correct poor teaching. While the Massachusetts Reform Legislation requires recertification every five years through staff development, the professional development of teachers of science and mathematics is not designed to enforce standards for teaching.

Involvement of teachers in the development of curriculum and/or programs which they use is an effective model for professional development. Teachers gather information, materials and other resources, consider existing knowledge about effective teaching and learning, and develop a response to the problem. Project PALMS provided opportunities for teachers to attend institutes during the summer and to return to their schools to serve as lead teachers. Initially, each teacher who attended the PALMS Institute received a computer for her/his room and was responsible for demonstrating effective teaching of science and/or mathematics.

Higher education as partners also received PALMS grants which enabled faculty to provide professional development in the form of courses and institutes. Other types of staff development programs included classroom visitations for demonstrations of science and mathematics teaching, conducting family mathematics and science fairs, and round table discussion sessions. These discussions provided teachers the opportunities for teachers to write about and reflect upon educational issues and their own learning and teaching experiences, and to confront and examine issues and their assumption/beliefs about mathematics/science and learning. Project PALMS also allowed colleges

and universities change teams to redesign pre-service mathematics and science education programs. The change teams encouraged the attainment of higher competencies of content and processes suggested by the Frameworks.

School districts also received PALMS grants that they used for professional development activities. PALMS teachers were able to obtain release time to attend seminars, change team meetings, and curriculum development meetings. PALMS Resource Centers were set up in each region for use by all teacher of science and mathematics.

As the funding period for this initiative come to an end, efforts are being made to continue with the work already started. Change teams at the school district and regional levels have continued. Higher education change teams continue to work on the development of interdisciplinary courses and the improvement of prepracticum experiences for all pre-service teachers. Plans are now underway to determine the extent of changes in mathematics and science teachers' behavior as a result of the work of the partnerships.

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Recommendations of the 45th session of the International Conference on Education, with emphasis on recommendation n°6 concerning the use of new information and communication technologies in basic education

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Introduction

Because the theme of my presentation concerns the recommendations of the 45th session of the International Conference on Education (ICE), I feel it necessary to say a few words about the ICE and the International Bureau of Education (IBE) — the institute which I represent. We are a small division of UNESCO located in Geneva, but we are proud of our past. In fact, the IBE is one of the predecessors of UNESCO. Founded in 1925, it became four years later the first international governmental organization in the field of education. Such eminent personalities as Albert Einstein, Henri Bergson, Delcrose and Jean Piaget were among those who supported the idea of creating the IBE. Piaget occupied the post of IBE director for forty years. Since 1969 the IBE has continued its activities within UNESCO.

One of the traditional activities of the IBE, the beginning of which goes back to 1934, is the International Conference of Education. It is a world forum of ministers of education and other partners in the educational process. Until 1996 the sessions of the ICE were convened every two years to discuss themes of particular importance for educational development, suggested by UNESCO's General Conference. Since the beginning of the 1990s the ICE has addressed the topics of literacy; the contribution of education to cultural development; education for human rights, peace and democracy, and, finally, in 1996 it examined the problems of teachers and teacher education. At that time, the Conference adopted a Declaration and a set of nine recommendations, constituting a single document, although addressing different topics: recruitment ; initial and in-service teacher education; teacher's autonomy and responsibility; partnerships in education; information and communication technologies; solidarity with teachers working in difficult situations; and regional and international co-operation.

In my quality as representative of the Director-General of UNESCO, I also feel obliged to introduce to you briefly into some of UNESCO's major concerns in education. I have found that the best way to express them would be by using the words of Federico Mayor, Director-General of the Organization, drawn not from his official speeches - in which he certainly develops the same ideas - but from the notes taken during one of his meetings with UNESCO's staff. UNESCO - he said - has many tasks but only one mission — peace — which should be built by promoting human development, justice, freedom and intellectual and moral solidarity... UNESCO should be in touch with all sections of society to ensure the general mobilization needed to bring about the transition from the law of the strong to the law of reason, from a culture of war to a culture of peace, based on dialogue and persuasion... UNESCO's action should be forward looking, and education is the key to the future that we so deeply desire for our children and their children. Education, as a fundamental right, must be accorded political and budgetary priority. External assistance - however valuable and welcome it is - can never be a substitute for a political commitment to education by all governments and all citizens. Education is too important for the future of each nation to be the victim of economy measures. From this point of view, the commitment of nine high population countries - which at the same time have the highest numbers of illiterate persons - to invest some 6% of their GDP in education by the year 2000, is an excellent example that should be followed by other countries » (end of quotation).

Progress towards education for all

One of the most important priority areas of UNESCO is, undoubtedly, the promotion of Education for all. As you know, in 1990, the representatives of governments, major international agencies, including UNESCO, and NGOs met in Jomtien (Thailand) at the World Conference on Education for All with the aim of mobilizing the international community to combat illiteracy and promote basic education for all children and all adults of our planet, thus making the dream of a literate world into reality. In 1996, the Secretariat of the International Consultative Forum on Education for All completed the mid-decade review of progress towards Education for All, a world-wide exercise that allows us to see where we stand, six years after Jomtien. Globally, the results of this review show that there has been definite progress in basic education. Not to the same degree in every country; certainly not as much as we had hoped; but significant steps have been taken towards achieving the goals. The results of the mid-decade review may be presented through the following data:

- between 1990 and 1995, enrolment in primary education in all developing countries grew by 50 million pupils, double the pace observed in the 1980s.
- net enrolment ratios have risen. They now range from 66% in Sub-Saharan Africa to almost 99% in Latin America and East Asia. Primary enrolment in 80% of all developing countries has been steadily growing since 1990.
- The percentage of first graders reaching grade four of primary education also increased and stands at a level varying from 75 to 94%, depending on the region, although drop-out continues to be a major problem in all developing regions;
- The number of out-of-school children has actually declined from 128 million in 1990 to 110 million in 1995.
- Since 1990, reported enrolment in early childhood programs has grown by some 20%, now reaching 56 million young children, or one out of five children between 3 and 6 years of age.
- Public expenditure on education as a percentage of GNP has grown in all developing regions, except South Asia.

Not all achievements or shortfalls can be quantified; there are other non-quantifiable - however, no-less-important parameters - that deserve mention. Among them, a growing emphasis on the quality of education. More attention is being given to children at risk - street children, refugees, war victims - many of whom have been reached through programs combining education, health and nutrition.

Yet, if the achievements of the last six years give grounds for optimism, they provide no room for complacency. In nearly all areas, the progress achieved was slow. Much more remains to be done to meet the basic learning needs of people in all countries. Among the most serious problems are the following:

- Gender disparities are still the main constraints to achieving Education for All. Two-thirds of the world's illiterate adults - 565 million - are women.
- In too many countries, the quality of education offered is often of an unacceptably low level, leading to high repetition and drop-out rates.
- Not enough is being done to reach the millions of children still out of school. The unschooled and illiterate youth and adults are still largely forgotten.
- Another area of major concern, the deteriorating status and working conditions of teachers, presents an alarming picture.

All the above-mentioned areas, as outlined by the Conference in Jomtien, constitute what can be called "continuing challenges". But the world has evolved considerably since 1990. New challenges with which education is confronted have emerged. Among them are the trend toward a more open society and global economies; the growing recognition of the multicultural character of societies and their cultural and value aspects. Escalating violence caused by growing ethnic tensions and other sources of conflict make the building of a culture of peace and the promotion of tolerance and mutual understanding an urgent necessity.

The Jomtien Conference fixed many targets to be achieved by the year 2000. This date is approaching. The end-of-decade review of the progress achieved and an analysis of the situation has already begun. They will be presented during the year 2000 to another global Conference on Education for All.

Recommendations of the 45th session of the ICE: a new role for teachers

The general idea which permeates the entire set of all Recommendations is that the teacher is irreplaceable in the teaching/learning process and her/his role will become even more important in the next century. But, at the same time, this role will be substantially different from that in the past. This same statement is made in the Report of the International Commission on Education for the 21st Century (known as the Delor's Report). The teacher's mandate is to teach, educate, guide and evaluate, but also to demonstrate the ability for self-empowerment, as well as the ability to renew the school, making it more open to change. The general public expects that the teacher should not only be successful in transferring knowledge but also in providing social training, developing curiosity and an aptitude for self-initiative, as well as for self-determination. In particular, the teacher should be a model on ethical and moral questions, and in creating good relations with pupils and in gaining their confidence. The teacher's role in the classroom is becoming more and more that of a guide, a facilitator, a generator of learning in the group, rather than merely that of a provider of knowledge. Moreover, given the growing competition on the part of other providers of information (e.g. the mass media, businesses, etc.), the teacher is expected to play the role of moral and educational counsellor enabling students to orient themselves in this maelstrom of conflicting information. By performing the function of co-ordinator of educational actions among various partners - and centred around common educational goals - the contemporary teacher should also be an agent of

change in his/her community, increasing its educational potential. In relation to the new information technologies, the teacher's role is not limited to developing instrumental skills and techniques in pupils, but also to stimulating reflection on the possibilities, effects and limits of informatics in society.

In other words, the teacher should not be like a priest delivering his pastoral message to the congregation, but rather like the conductor of an orchestra who attempts to develop the individual potential of each musician to the maximum capacity, in order to achieve harmony in the performance of the whole team.

Faced with miraculous advances in technology, we may exaggerate by saying, for example, that the traditional role of the teacher should be radically changed or even abandoned. On the contrary, we should retain the best educational traditions and draw lessons from the teaching of eminent educators of the past. The importance of a broad general education for all citizens, and especially for teachers, is more and more recognized. What is new in our life is abundance of information. It is the teacher's role to help students to navigate in the ocean of information, to select, to critically analyze it, and incorporate it in their own system of the perception of the world. In other words, to teach the learner to transform information into knowledge and knowledge into correct understanding of the world, and then to translate the acquired competence into socially useful action. The teacher should help learners to create their personal school - and why not a personal university and research laboratory? - in which they will always be a teacher, a learner and a researcher at the same time.

Recommendation n° 1: Recruitment for the teaching profession

Its key message is "attracting the most competent young people to teaching". This Recommendation responds to one of the main problem with which we are confronted: the low prestige of the teaching profession discourages many talented candidates from applying to teacher training colleges and universities. A student who is not motivated can hardly become a good teacher. We know, of course, the factors which are behind this phenomena, one of them is an insufficient remuneration of teachers compared to other professions.

The Conference recommended improving professional guidance and orientation towards a teaching career; offering incentives and scholarships to students with good academic records and wishing to become teachers. And to encourage qualified people from other professional fields to enter the teaching profession. This Recommendation also addresses the question of gender

equality. While in most countries of the world the proportion of women teachers is on the increase (attaining sometimes 90% and even higher in primary education), there are a certain number of countries where the participation of women is very low (below 20%; the lowest figure is 6%).

Recommendation n° 2: Pre-service teacher education

The key message here is "a better linkage between pre-service training and the demands of an innovatory professional activity". The main concern of this recommendation is linked to the fact that teacher training institutes do not prepare future teachers for the multiple and complicated reality of teaching practice, do not equip them, for example, to use the active learning methods, or for work in multigrade or multi-cultural classes. The cultural issues are particularly emphasized. The teacher should transmit culture, form personal and social relationships, teach the learners to "live together", respect cultural diversity, human rights, peace and democracy and respect the environment. To this it can be added that the debates in the Education Commission at the recent session of the UNESCO General Conference stressed the need for teacher-training institutes to prepare a polyvalent teacher, one able to work in formal and non-formal educational contexts.

Recommendation n° 3: In-service teacher education

The main idea of this Recommendation is that in-service teacher education should be both a right and a duty for all educational personnel, and that initial and in-service teacher education should constitute an organic whole.

Among the measures suggested by this recommendation are the following:

(a) a minimum of training opportunities should be guaranteed for all teachers;

(b) special attention should be given to beginning teachers through induction courses and in other forms;

(c) Teacher-training institutes should be actively involved in in-service training activities and benefit from the experience thus gained for improving initial teacher education;

(d) In-service programs should be organized to a greater extent within the school;

(e) In-service teacher education programs should be accompanied by professional support services, in order to help teachers in their professional development.

The Recommendation calls for urgent measures in relation to untrained and under- qualified teachers.

Recommendation n° 4: Autonomy and responsibility of teachers

The main concern of this recommendation is how to find a proper balance between national objectives and standards in education, and the autonomy and initiative of schools and teachers. There is a trend observed in many countries to set up some national, rather general, frameworks or objectives, "attainable targets", while leaving the school and local educational authorities to find a way to achieve them. In most cases, however the educational authorities retain the right to evaluate and control the performance of schools. A greater degree of autonomy is, therefore, accompanied by a greater degree of accountability. Empowering the school and teachers with a higher degree of autonomy and responsibility within a decentralized approach to educational management requires a higher degree of competence on the part of the school administration and teachers. The Recommendation also calls for a larger involvement of teachers in the process of consultation, which should not be limited to the execution of reforms but should also concern their initiation, design and evaluation. And, naturally, schools and teachers should have more liberty in initiating and implementing innovations and experimentation inside the school.

Recommendation n° 5: Teachers and their partners

The key words of this Recommendation are "Education is a responsibility for all". There are two opinions: one considers that schools and teachers are responsible for all the ills of the education system; and the other that teachers are the victims of bad conditions of work and the low esteem of their profession in society. Although there are some elements of the truth in both of these opinions, the participants at the ICE resolutely associated themselves with one of the statements of the Delors' report: "It is important not to lend credence to those who would ascribe all the ills of our societies to what some people consider to be ill-advised educational policies. It is up to society itself to find the remedies for its malfunctions and to find the elements with which to rebuild its social fabric and the interpersonal relationships that make it up".

New forms of partnership should be found in each society's cultural, political and administrative contexts. Education is nowadays provided to a much greater extent than in the past outside the school. The impact of the mass media, especially television, is well known and is the subject of on-going discussions

among educators and in the society at large. TV programs - transnational, intercontinental - intervene with force into the cultural fabric of each nation. The mass media should not, however, simply be blamed. It's one of the realities of our time. And they also transmit a lot of useful information. But at the same time, many programs are educationally and culturally unacceptable. It is the duty of teachers and the family to teach pupils to select information, to help them to create in their own minds barriers against morally and culturally abusive information. What should the response of the school and the teachers be? To work together with the family and the mass media to inform them about the school's objectives. Perhaps even more: the school could assume the role of co-ordinator of educational activities by the different partners —family and community in the first instance, and to contribute to increasing educational awareness, educational potential and knowledge in the community and in society at large. Business circles, religious and cultural associations, NGOs - in addition to family, parents' association and local communities - may largely contribute - intellectually and financially - to the success of the school. The school should be open to society, in parallel to the opening of society to the school - this is the main message of this recommendation.

Recommendation n° 6: Information and communication technologies: serving to improve the quality of education for all

The ICE endorsed the conclusions of the Delor's report: "The new information and communication technologies represents one of the key elements in a changing world... by abolishing distance, they are instrumental in shaping the societies of tomorrow which, because of these technologies, will have nothing in common with any model from the past. The most accurate, up-to-date information can be made available to anyone, anywhere in the world". The ICE added: "the computerization of education is one of the most important means to shift emphasis away from the more pragmatic objectives of narrow specialization towards the acquisition of basic interdisciplinary knowledge". The education system should learn to master them in order to avoid any technological, cultural and economic subjugation, as well as any marginalization of the school compared to other sectors. If the schools fail to cope with the development and integration of new technologies in teaching, and if the methods for seeking knowledge in the school and outside the school become too different, the school will end up in a crisis of legitimacy. In a society rich in information, the school no longer has a monopoly on facts, information and knowledge, which means a change in the function of the school.

The ICE suggested the following measures:

- not limiting the application of new information technologies exclusively to the learning process. The use of these technologies in the administration and management of the school and by the local community could save time for and improve the performance of teachers;
- giving teachers the opportunity not only of mastering the new information technologies for teaching purposes, in conjunction with other educational technologies, but also of contributing to the development of educational software and methodology;
- using new technologies to encourage communication networks and exchange programs among teachers, pupils and schools;
- introducing ways of using new technologies based on the idea of technological resource centres available to all;
- strengthening joint efforts among governments, educational authorities, teachers and teachers' organizations, businesses and industry to ensure the availability of adequate new information technologies at all levels of education; and
- developing research and information exchange on the impact, role and limitations of the new information and communication technologies in education.

In 1996 UNESCO organized in Moscow the 2nd International Congress on Education and informatics. Both the outcomes of this Congress and available research reports allow us to formulate several conclusions:

(1) The technologies by themselves are not going to bring about improvement or change in the teaching process, unless they are employed in innovative and effective ways by teachers. Teachers, therefore, play a central and constant role in structuring the learning process;

(2) Teacher education is considered to be the single most important factor in ensuring the successful use of information and communication technologies in education. Its importance has tended to be overlooked or underestimated in the development of initiatives for introducing these technologies into schools, with the result that projects may be doomed to failure on never reach their full potential. This is true not only of developing countries but also of industrialized ones. Teacher education is not only vital for equipping educators with the necessary skills for using ICTs effectively in the classroom, but for helping teachers to overcome their often strong resistance to these

technologies and to develop positive attitudes towards them. Organizing the training of teachers on such a massive scale is a major challenge for any education system.

(3) The potential of ICTs to transform the education process is still far from being fully realized. In theory, ICTs, through their potential for distance learning, could greatly facilitate the provision of teacher education in situations where there are large numbers of untrained teachers, limited in-service training facilities and few training institutions or teacher educators.

At the Moscow Congress, several speakers pointed out that the development of educational software should not be left to the industrial and commercial world alone. Teachers and their professional associations should be encouraged to become pioneers, innovators and initiators in the wide application of new technologies in education.

One of the most important decisions adopted by the last session of the General Conference of UNESCO is the creation in Moscow of the UNESCO Institute of Informatics in Education. Among its functions there are two which are particularly important for developing countries: (a) to contribute to applying information and communication technologies for educational purposes so as to derive advantages from a collective know-how, as well as a joint utilization of limited resources; (b) to foster the preparation, professional evaluation, selection and world-wide dissemination of prospective innovative technologies, as well as updated means of communication.

In their reports to the IBE and in case-studies prepared for the Moscow Congress, many developing countries, particularly in Africa, pointed out that they did not have sufficient resources to purchase and maintain new technologies. However, the most sophisticated technologies are already present in developing countries; for example institutes from thirty developing countries are using on a regular basis the information available on the IBE databanks, through Internet, there are experiences in several developing countries (Egypt, Botswana, Belize, etc.) on introducing ICTs at the national scale. These experiences will be presented in the December issue of the IBE's newsletter INNOVATION.

The lack of money is a real problem. The absence of policies concerning ICTs in education - which was also reported by some developing countries - is a more serious one. In this respect, don't forget the saying by Mr Mayor: "it is not the lack of money, it is a question of priority ".

Recommendation n° 7: Professionalization as a strategy for improving the status and working conditions of teachers

The key message of this recommendation is that working conditions cannot be separated from policies on strengthening the role of teachers. At the same time, improving the material circumstances of teachers, particularly their salaries and other social benefits, represents a necessary but insufficient condition for improving their status. In an integrated policy to improve the status of teachers, professionalization is the most promising strategy. In concrete terms, the ICE recommended:

- providing the necessary resources to ensure teacher training at the level of higher education;
- implementation of high-level career-long professional development, the creation of diversified structures underpinned by appropriate appraisal systems;
- establishing performance incentives for teachers. These incentives need not be limited to monetary incentives but should include opportunities for advanced training, formal recognition and career opportunities;
- establishing a balance between the rights and responsibilities of teachers, as envisaged by the ILO/UNESCO Recommendation concerning the status of teachers.

Recommendation n° 8: Solidarity with teachers working in difficult situations;

Teachers in numerous countries are faced with the problem of teaching particular population groups (destitute people, marginalized groups, refugees, migrants, street children, delinquents, women from traditional societies, etc.) or working under particularly difficult conditions (remote, mountainous or rural regions, multigrade or overpopulated classes, etc.). Armed conflicts, often crossing international borders, represent a particularly worrying situation. Despite their variety in importance and type, all of these situations require of teachers, more than in any other circumstances, the mobilization of their emotional and psychological capacities and their various skills, in short, true polyvalence. Under such circumstances, the school and the teachers need, first of all, moral and material support and - in the case of armed conflicts or natural catastrophes - expressions of solidarity from the national and international communities, as well as rapid aid and intervention.

The ICE suggested taking the following actions, modified for each particular situation:

- to encourage teachers originating from difficult areas and those motivated to work in such areas by organizing pre-service and in-service training in these very places. Incentive measures should include, for example, allowances, advantages, an appropriate system of promotion and the possibility of transfer to calmer regions after a certain number of years of service in difficult situations or zones;
- during the training of teachers expected to work in such situations, envisaging a further specialization, such as training as educational therapists, school psychologists or rehabilitation teachers. It would also seem desirable to reinforce preparation in the art of communication, negotiation and conflict resolution during their training;
- backing up teachers and educators with support services, composed particularly of specialists in educational and vocational guidance and in educational psychology, and, of course, ensuring the security of educational staff;

Recommendation n° 9: Regional and international co-operation;

This recommendation states that regional and international co-operation should be used as an effective instrument to promote teacher competence and teacher mobility through, in particular, the development of networks of information centres, teacher training and educational research institutions, encouraging in-service training courses, study visits and exchange opportunities for teachers abroad. Co-operation in developing national systems of educational information, as well as sharing the outcomes of comparative studies and experiences concerning educational innovations - including those in the field of new information and communication technologies - was also deemed important. This recommendation also suggests seeking specific possibilities for improving the status of teachers in the least-developed and the most indebted countries, for instance, by reducing their debts by sums corresponding to the increases for this same purpose in their budgets.

In concluding my brief review of recommendations adopted by the 45th session of the ICE, I should mention that, contrary to the conventions, they do not impose on the states the legal obligation to follow them. Their authority is entirely moral, as they express a consensus emanating from the ministers of education of most countries of the world. Based on comparative analyses of the

situation in many countries, they allow each of them to "see itself" in the mirror of world developments and to compare their achievements or failures with those of other countries. And, of course, these recommendations provided a degree of guidance and direction as to where to go. Other Conferences, similar to the ICE, play an important role in achieving UNESCO's priorities which, in the area of education, are: providing quality basic education for all; promoting gender equity ; reaching the "unreached" and discriminated groups of population ; contributing to the renovation of education through, in particular, mastering modern information and communication technologies and - in geo-political terms - the least-developed countries, Africa in particular. The Fifth International Conference on Adult Education (Hamburg, Germany, July 1997) and the World Conference on Higher Education which will take place in Paris in October 1998 represent two major events in the field of education.

UNESCO's action could not be efficient if it did not benefit from parternships with many hundreds of NGOs, associated with it and working in its fields of competence. ICET is one of them. I can say even more: your organization is one of UNESCO's principal partners among NGOs. Its activity is appreciated by UNESCO which can be shown by the following extract from Mr Mayor's letter addressed to his Majesty Sultan Qaboos on the occasion of this Assembly: "ICET has served as a unifying network in the international teacher education community for over forty years and has been a partner of UNESCO in the service of international co-operation and educational development since 1973". Your organization is presently faced with some difficulties, but we in UNESCO believe that they are temporary and will pass. ICET has a solid constitution, bringing together all the main fractions of teacher educators: representatives of ministries of education, universities and other teacher training institutions, as well as many outstanding teachers and scholars. Its potential is very high and, no doubt, it will assume more material form in the future. Certainly, you can count on UNESCO's support. UNESCO, in its turn, expects to receive a greater contribution from ICET. During my talks with Mrs. S. Klassen and other members of the Board we agreed on a number of measures to reinforce our co-operation. We agreed, in particular, that the most interesting innovative projects and experiences, presented at this Assembly will be published in the IBE's newsletter Innovations in March of this year. ICET is also invited to participate actively in the preparation of the World Conference on Higher Education, and in the Conference itself, more precisely, to a thematic debate on the contribution of higher education to the development of the education system as a whole.

I wish you full success in your work and a Happy New Year.

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PART V

Education in Oman

The Sultanate of Oman and a New Educational Reform

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The Sultanate of Oman is one of a number of countries recognizing that educational reform will help the country grow and prosper. His Majesty Sultan Qaboos, who is a strong believer on education for all Omanis, has given his full support to the Ministry of Education to design, pilot, and implement educational reform for the whole country. His Excellency, the Minister of Education, has taken the responsibility of investigating educational reforms in other countries to take the best of what they have and adapt it to Omani culture.

The new reform is going to take place in September of 1998. The new reform will have basic education which will consist of two stages; stage one from grade one to grade four and stage two from grade five to grade ten. Then students who want to continue after basic education can join secondary education, which is based on two years. The new reform is going to be implemented in all the schools in the Sultanate by the year 2000.

To maximize students benefit, the Ministry decided to extend the school year from 160 to 180 days. Also the school day will be expanded from four to five hours and the lessons will be lengthened from 35 to 40 minutes. Omani schools will be equipped with modern computer and science labs as well as learning resource centers.

Curriculum in the new reform will be based on successful theories and practices in the current education arena. The curriculum is going to encourage critical thinking skills, problem solving, and experiences and practical applications to real life situations. Students' prior knowledge will be a major factor in choosing the topics. The curriculum will be integrated and the different subjects will be connected to give students opportunity to learn in a more natural way. The curriculum will shift from teacher-centered to child-centered.

THE SULTANATE OF OMAN AND A NEW EDUCATION REFORM

Introduction

Sultanate of Oman is one of a number of countries recognizing that educational reform will help the country to grow and prosper. His Majesty Sultan Qaboos, who is a strong believer in education for all Omanis, has given his full support to the Ministry of education to design, pilot, and implement educational reform for the whole country. The Ministry of Education has taken the responsibility of studying the various forms and patterns for educational system in order to determine the most appropriate ways of reforming education system in Oman.

Background

The Ministry of education has showed strong indications of the importance of the role the Ministry plays in developing the country. Before 1970 there were only three schools in the Sultanate of Oman with 909 students (Ministry of Information, 1995). In 1970, when His Majesty Sultan Qaboos began his rule, the first girls' school was established. His Majesty gave orders to establish boys and girls schools in different parts of the Sultanate. To prove the importance of education for the Omani population, at the second national anniversary of the country, the 17th of November1972, H.M. Sultan Qaboos showed his concern (Ministry of Information, 1991) as follows:

> Education was my great concern, and I saw that it was necessary to direct efforts to spread education. We have given the Ministry of Education the opportunity and supplied it without capabilities to break the chains of ignorance Schools have been opened without taking into account the requirement. The important things that there should be education, even under the shadow of trees. (p. 19)

Education in Oman has continued to grow. In the first five-year plan of 1970-1975, education started growing very fast to all parts of the Sultanate. Even though the Sultanate of Oman began with three schools in 1970 but by 1975 the number of schools reached to 207. According to the Educational Planning Department (1990), in the school year 1990-1991 there were about 360,066 students in more than 800 schools in the Sultanate of Oman. To accommodate all students, schools had to work on two shifts, morning and

afternoon shifts. As a result of having two shifts, the lessons had to be condensed to accommodate all the required subjects. There are 35 minutes for each lesson and the total hours of instruction everyday are between four and six hours. The total number of school days in each year is 160 days. The current education system allows students to go through three stages of a total of 12 years, six years of elementary, three years of preparatory, and three years of secondary education (Ministry of Education, 1990). Those practices were successful at that time but with the growth of the Omani society and its need, Oman found it is time to bring in new practices which the Omani society needs for the advancement of the country (His excellency, Sayyid Saud Al Busaidi, 1997.)

THE NEW REFORM

Introduction

In early 1994, the Ministry of Education prepared a report of the obstacles it is facing in delivering education that serves the needs of the country and how to improve the current education system. The Government suggested recommendations to the Ministry of Education and the result of that was Vision 2020, which included goals to be met by the Ministry of Education. First, continue spreading education in all parts of the country. Second, improve the current curricula taking into account what is current in science and technology advancement. Third, improve the educational practices to also include current technology in education. Fourth, advance staff development technically and administratively. Fifth, create a basic education that can prepare students to continue their education or join the work force. Sixth, prepare students that can join work force with minimum training (Ministry of Development, 1995).

The fifth year plan of 1996-2000 for the Sultanate of Oman focuses on the development of human resources. The Ministry of Education issued a plan to improve the education in Oman. The intention of the new educational reform is to prepare Omani citizens who can face today's world challenges in science and technology and be able to interact with it critically and scientifically. To reach that goal, the new educational reform had to bring changes to the current system. The Ministry of Education studied different new educational reforms to come up with a unique educational reform that takes into account the Omani educational philosophy that matches with Islam and the Omani culture.

Since education is the foundation of human development, the reform became the foundation for the economical advancements of the country's

needs. The reform goal is to build Omani citizens who can become more productive members in the Omani society and who can improve the economy of the country. (Sayyid Saud Al Busaidi, 1997). According to the Educational Planning Department (1997), in the school year 1997-1998 there are more than 508,543 students in the Omani schools in more than 967 schools. All those students are ready for improvement to survive today's' challenges. As stated by the Ministry of Education (1995):

> The challenges facing Oman, particularly the need for self sufficiency and the need to diversify the economy and keep pace with technological change, require new educational goals to prepare Omanis for life and work in the new conditions created by the modern global economy. These will require a high degree of adaptability and a strong background in mathematics and science in order to independently apply rapidly changing technologies to Oman's needs. The proposed educational reforms are designed to achieve the knowledge and mental skills and attitudes that young Omanis will need to learn and adapt to the very different future most of them will face. (P. I)

The new reform covers many different areas. Some of these areas are: developing the aims of education, improving the curriculum, upgrading teacher's qualifications, changing ways of assessment, demolishing the afternoon school system, extending the school year and day, and improving various education practices as a result of the new educational goals.

Major changes that will be brought up in the new reform

Aims of education

The aims of education in the new reform in Oman are going to be a continuation of what the Sultanate of Oman has started 26 years ago. It also added to the factors of satisfying the economical and educational needs for Oman, as well as meeting the technological and scientific advancements of the country. The outcome is to prepare Omanis who are capable of participating positively in the country' development and facing the challenges of the twenty-first century. Based on the country's need, there are four bases for the Omani education. First, building positive interaction with the past and the future in the Omani citizens. Second, spreading the developments in the Omani society. Third, stressing the need to adopt change and to participate in it. Fourth, stressing the importance of the scientific thinking in life and preparing domains to use it as well as being able to use technology in every day life (Ministry of Education, 1997).

Developing the curriculum

Since the intention of the Omani government is to create self sufficiency for the country's need, it is the role of the Ministry of Education to fulfill the need through planning and presenting the right education to the Omani youth. Curriculum developers have to pay attention to the students' age, background, and level of thinking. Omani students need to be exposed to similar information to what is offered to students in advanced countries so Omani students be able to complete their education, or attend training sessions in those countries with out problems. (Sayyid Saud Al Busaidi, 1997).

Improvement in the curriculum looks at different aspects but the two main ones are the content of the curriculum and the teaching methods. In the content of the curriculum the main improvements are going to be based on four changes. First, reducing the theoretical contents. Second, connecting the material to the students' lives. Third, connecting the curriculum to the students' environment. Fourth, aligning the content and the plan of the curriculum with the students' level at each educational stage. In teaching methods there will be also changes. First, teachers will be advised and trained to stay away from basing their teaching and evaluation on rote memorization. Second, concentrating on learning through experience (Ministry of Education, 1997).

The Ministry of Education came up with these main changes in the curriculum after careful study of what is successful in different reforms and in the educational arena as long as it agrees with the Omani society and educational needs. The new curriculum will foster critical thinking skills, problem solving, experiences and practical applications to real life situations. Students will not be encouraged to memorize facts. Students' prior knowledge and background experience are important factors for learning and these will not take place without students' interest (Ministry of Education, 1995).

As Gardner (1993) and O'Neil (1993) have indicated, when students enter the classroom they bring with them their views of teachers expectations, their knowledge of the subjects and their view of themselves as learners. Curriculum guides should take into account the students' prior knowledge and teachers need to spend time helping students so they can build on these experiences. Students will be encouraged to think and will not simply be fed the sterile facts (Siegel and Shaughnessy, 1994). We want students to think for themselves and arrive at their own understanding. Students need to learn what is real, interesting, and relevant (Applebee, 1994).

According to the Ministry of Education (1995) in all the curriculum development, the student is going to be the center of education. These changes will require preparing students and teachers for this change. One of the implications of child-centered education is to encourage students to investigate and find answers to the questions and phenomena rather than teachers give and explain the answers to the students. Students are going to be encouraged to learn through problem solving and experimental learning. Students have to learn based on what they experience in their daily lives.

For education to be relevant, students need to connect what they already know with new concepts. Students need to have authentic materials that are real, rich, and contain complex ideas with a variety of learning activities. Students' learning increases when they work in cooperative groups, engage in social interaction, learn to listen to each other, dialogue with peers, write stories to one another, and collaborate on projects. Students need to be encouraged to give their opinion in class discussions. When students are encouraged to express their ideas and how they solved a problem, their understanding of the topics deepens as they learn from each other. Students can be encouraged to stretch their thinking to higher levels through activities that require analytical reasoning, interpretation, metaphorical thinking, creative design, categorization, hypothesizing, drawing inferences, synthesis, and more (Zemelman, et al., 1993).

When students memorize for the single purpose of passing a test, only to forget these facts after the test, learning has not taken place. Education should be developmental, which means that we have to keep in mind that not all students are at the same level. Educators should be encouraged to respect students' different abilities as these differences occur because of students' individual physical, intellectual, and emotional growth patterns. When we create curriculum we have to keep in mind that each student is unique and we have to encourage students to ask, "why?" The classroom should be an active community of learners, doing, talking, and collaborating (Boyer, 1995). This does not mean that each subject will be dealt with separately but there will be connection among the different subject's matters. The new Curriculum is going to be an integrated one that will help the students' mental and linguistic growth.

The Ministry of Education is paying a great attention to the teaching of languages, Islamic studies, and social skills. Students need to learn Islamic Studies since Islam is the religion of the Omani people and they learn Arabic studies because it is the official language of the country. English language is

also given a lot of attention and is going to be taught from grade one instead of grade four as it is in the current system (Ministry of Education, 1995.)

Social Studies will help students to develop their personal and national identity. Through Social studies students will create an interest in different aspects of gaining knowledge. An important part of social skills is the "life skills" which will help students gain knowledge of how to act and make decisions in everyday life by presenting different scenarios of situations in the Omani society where students then solve those problems. Later on students are given the chance to discuss what they have learned from those situations (Sayyid Saud Al Busaidi, 1997),

Also the science and mathematics curriculum and teaching strategies are going to be developed and improved. The main development is introducing new scientific concepts that did not get the chance to be introduced before because of the two shifts in schools. With mathematics students will be taught how to analyze, and apply what they have learned in a scientific way. Extending the school day and year will allow more teaching to these subject matters. Students will get the chance to research through computer labs and experiment through science labs. There will be de-emphesize on rote learning and increased imphesize on learning through direct personal experience.

In the English curriculum the major improvement is going to be in introducing it from grade one instead of grade four. It will also be taught in greater depth and with increased number of hours than it is now. No one can ignore the importance of the English language today, not only in Oman where it is used as a second language, but globally as well. In the past thirty years English has become the major language for international communication in education, trade, economics, and politics (Renner, 1993). According to Famighetti in *The World Almanac and Book of Facts 1996* (1995), there are 478 million speakers of English in the world, and of these, 326 are native speakers and the other 152 use English as a second language. English is the second most widely spoken language in the world (Whitelaw, 1994). Karel (1989) reports there are more than 40 countries using English as an official language. Wall (1996) indicates there are between 800 million and 1 billion people who use the English language in one form or another. In order for the Sultanate of Oman to participate successfully in today's global economy, Omani citizens must be competent users of the English Language. According to the Ministry of Education (1995) students in the current system are exposed to 618 hours of instruction but with the reform it is going to be 1200 hours.

Teachers' Training

No matter how much preparation for a new reform a system goes through, it is not going to be successful if teachers are not fully ready for it. The Ministry of Education has prepared a pre-service program of training with the coordination with the Ministry of Higher Education to train teachers to teach effectively in the new reform. The in-service programs help teachers in the current system to understand the reform and also to prepare them to teach successfully. Teachers will go through extensive training to be ready to apply the new practices in the classroom. Also the current elementary teachers who had two years of college education will go through upgrading courses to end up with four-year teachers' education.

Students' Assessment

There is little theoretical agreement about how we should assess students. Herman, Aschbacher, and Winters (1992) have said that behaviorists claim that we need to start from rote basic skills and move to higher thinking skills. Cognitive psychologists say learning is continuous and not linear, so students need to be assessed in terms of their prior knowledge, on what they connect to i.e., their schemata. De Fina, Anstending, and De Lawter (1991) have emphasized that no matter what kind of assessment used, students should be assessed on what they actually know, not on what they need to know. Authentic assessment advocates would add the proviso, "and what students can do with their knowledge."

Perrone (1994) has documented the current move toward authentic assessment, performance assessment and portfolios. Howard Gardner (1983) has claimed that standardized tests require short answers, whereas real life does not present itself in multiple choice questions. Gardner and Boix-Mansilla (1994) have noted that many students drill in the classroom and pass examinations, but when they are given a situation or a problem to solve, they find it difficult to do so.

Today educators are moving toward authentic assessment, performance assessment and portfolios (Perrone, 1994). Flood, Lapp, and Nagel (1993) have indicated that the testing movement in the 1980s shifted from paper and pencil testing to new performance-based assessment. According to Hart (1994), "An assessment is authentic when it involves students in tasks that are worthwhile, significant, and meaningful. Such assessments look and feel like learning activities, not traditional tests" (p. 9). Performance assessment does

not depend on right answers. The Sultanate of Oman is going to be among the countries that implement performance assessment in its reform.

Today educators design authentic assessments that ask students to solve complex problems using prior knowledge. Clearly there is a difference in students' performance on topics about which they have no prior knowledge, as compared to their performance on topics they know something about. Herman et al. (1992) have found that students cannot write about a topic which they have no prior knowledge. Mosenthal and Kirsch (1992) studied students' prereading and postreading performance. The study concluded that students with some familiarity with the content tended to write better than students without familiarity. Prior knowledge is the foundation on which new knowledge is built. Sammons and Davey (1993-94) have pointed out that all students have different understand and awareness of topics, and that consequently, their reading strategies will be different.

Wiggins (1993) has stated that schools should aim for better assessment and not better testing. Schools need to improve students' performance, not just monitor it, and be fair in assessing all students. Students should learn from the assessment process, and the negative effects of traditional testing should be minimized. This means understanding and putting into practice the aims of education and applying what is relevant to the daily lives of students. Like adults, students get satisfaction from their work.

In the Sultanate of Oman the students assessment is going to be a continues process to gather and review information to help students succeed. The Sultanate of Oman is intending to concentrate on authentic assessment.

In every reform, assessment of students is a major challenge to make sure they are working together and supporting each other. Students' assessment also measures whether the objectives have been met or not. Through students' assessments, students, parents, teachers, curriculum developers and any other concerned person can get feedback on the content of the curriculum, teaching instruction, and students' abilities in learning the content. Through the assessment of students' performance, one can define the problems and start solving them.

Abolishing afternoon schools

According to the Educational Planning Department (1995) reported that there are 704 schools in the Sultanate that have two shifts in their buildings. The Ministry of Education realizes that one of the main obstacles facing the

educational reform in the Sultanate of Oman is when morning and evening schools share one building. Having two schools share one building has negative consequences. For example, each class period does not exceed 35 minutes, which means that each class is short of five minutes. That makes the school day short of half an hour of the instruction time, which results of 120 school days. This loss effects the amount of curriculum coverage. Teachers try to cover the curriculum in fast speed, which affects the way the learners observe the knowledge. As a result students try to memorize their lessons since there is no time to learn through experience (Sayyid Saud Al Busaidi, 1997).

There are negative effects on students who attend afternoon shifts. First, students reach their schools when they have already exhausted themselves through morning activities. Second, students suffer health problems because of the heat. Third, since there is little time for students to spend in the schools that makes it almost impossible to get involved in other school activities like visiting the school library, working in the science lab, or involving in sports. Research with elementary student's show that students at this age need extra attention and caring but in the afternoon schools students are rarely given the attention they deserve (Sayyid Saud Al Busaidi, 1997).

Extending the school day and the school year

When schools work on one shift there is a chance to extend the school day and being able to use it more effectively. Students get the chance to participate in different activities that allow them to observe knowledge in a positive way. When the school day gets expanded, lessons become longer, and other subjects get introduced which because of lack of time they had to be ignored. Also students get the chance to learn from experience and become active rather than being passive learners.

School year in the Sultanate of Oman is considered short when compared to other countries. According to the Ministry of Education (1995) the total number of school days at the present system is 160 days. When one compares the Omani school system to other countries one finds the total number of school days in some countries as follows; Japan and Germany 240 days, Southern Korea 226 days, Singapore 200 days, Canada it is between 197 and 205 days, and in the United States of America it is 180 days. To extend the school year means there is a better chance of improving performance when students get the opportunity of spending more time in activities that prepare them for their future.

Basic Education

Basic education is a term, which became popular in the 70s. It is defined as education, which provide major educational needs for the citizens, which is basic in developing the skills and knowledge for future education or future work. Many countries have assigned nine to ten years of basic education in their system. The Sultanate of Oman has decided to have 10 years of basic education. Within it there are two cycles, cycle one consists of four years and cycle two which consists of six years. When students complete basic education they will be able to continue their secondary education which will be two years or join the work force depending on their plans. This change will reduce the chance for students to leave the school system and as a result will minimize illiteracy level in the country (Ministry of Education 1995.)

The school buildings are intended to be assigned for either cycle one or cycle two and each school. This distribution will help students feel comfortable because they will be mentally and physically in similar stage with the rest of the group that makes it easier for the students to deal with each other. Educational wise schools will be equipped with science and computer labs as well as resource centers. Computer literacy is very important in today's life. Omani schools will be equipped with computers to allow students learn to use it in their daily work whether writing their homework or researching for projects. Also the Learning Resource Centers will be introduced in the new reform to replace the traditional libraries. Students will be able to access information in different ways and forms especially the electronic ones.

Teaching plan

What is meant of school plan is the distribution of number of lessons within a week. Studying the current practice, it is clear there is insufficient time in each period as well as lack of extra activities. Students do not get enough teaching instruction in each period, which makes teachers try to cover the basic knowledge in the lessons. Table one shows a comparison of what appears in the system at present and what is planned for in the new reform. By studying the table one sees that the extra number of hours that will be added to the reform in basic education.

TABLE 1

Comparison between the present education system and the intended reform in the total number of hours for ten years of education

Subject	Number of hours in the present system	Number of hours in the reform	The difference
Islamic Studies	915	1176	261
Arabic Studies	1381	1992	611
English Language	541	1200	659
Mathematics	933	1776	843
Science	635	1200	565
Social Studies	448	696	248
Physical Education	299	384	85
Arts	187	336	149
Music	168	216	48
Vocational Training	149	0	-149
Practical Activities	37	0	-37
Life Skills	0	240	240
Information Technology	0	120	120
Computer Skills	0	264	264
Total	5693	9600	3907

The Sultanate of Oman is prepared for the new challenge, which will take place in September of 1998. The reform is going to be started in 17 schools in the whole country and every year more schools are going to be added. As Fullan and Stiegelbauer (1991) emphasized that there is always loss, anxiety, and struggle with every real change. Oman is really prepared for this change and aware that starting a new reform requires need assessment for the country's need. Studying the country's social, economical, technical and political aspects was a necessity before starting the education reform. The Ministry established a committee to study the current educational aims as well as preparing the new aims which take into account the Islamic beliefs, the Omani environment, the Omani culture and costume, and the Omani political ideas. Based on those aspects the Educational aims were written to help Oman advance and prosper in the coming years (Sayyid Saud Al Busaidi, 1997).

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Using Instructional Technology to Prepare Teachers for the Information Age

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New teachers must have the basic skills when they enter classroom. Among these skills is the application of today's technologies of instruction like interactive video, computer assisted instruction, cooperative learning, games and simulations, audio tutorial systems and so on.. The purpose of this paper is to explore the use of instructional technology in teacher preparation for the information age. Further, it describes the essential elements in teacher preparation in the area of instructional technology and shows the new suggested roles for teachers in the new information-dominated era. In addition, this paper highlights some of the new trends in the field of instructional technology and presents a critical analysis of teacher preparation programs in the area of Instructional Media and Technology at some colleges of education in the Arab countries, showing both the weaknesses and problems of these programs. Content analysis is used as a tool for this analysis.

The paper concludes with some practical suggestions for the teaching of instructional technology in both teacher preparation and actual classroom instruction.

Historical background

Today's information age began with the telegraph which was invented in 1837. It was the first instrument to transform information into electrical form and transmit it reliably over long distances. By the year 1944 it was developed to send and receive messages between Washington, DC and Baltimore, Maryland. The new technology shortened the time for decision making and increased the pace and stress of the business day. In 1858 the Atlantic cable was established to carry instantaneous communications across the ocean. The year 1877 witnessed the invention of telephones whereby both transmission and reception were done. Industrialization in the 19th century made life faster and more complex (National museum of American history (1995).

To cope with these demands, new means of calculating, sorting and processing information were invented. In 1907 radio tube and amplifier were invented which led to a huge information distribution. After that, a flood of inventions in the area of communicating information took place, like TV (1927) xerography (1938), digital computer automatic (1944), information theory (1948), communications satellite(1962), open university planning (1967), word processing via computer (1972), low cost personal computer (1981), and many other new techniques of encoding and distributing digital information which affect the life of people (Knirk and Gusafson 1986).

In the late 1970 the information revolution began to accelerate due to societal emphasis on basic research on information processing , artificial intelligence, computers, and advances in publishing technologies. As a result, the generation and dissemination of information became easier and faster., This information revolution Also affected all communication processes including teaching. Since teaching is primarily an information handling profession, the near future for the teaching process will witness an exciting and radical change.

Today's world has witnessed an increasing utilization of information due to fast technological advancement, resulting in a huge flow of information from different sources to the individual. The information has become the major feature of this age and some people call it the information age. The rapid development of information flow has affected both our daily social life and our way of thinking. The child in this age is different from his fellow in the past. When he enters school, he has a lot of experience from exposure to the mass media like radio, television, computer programs and games, video games and movies and the like. His visual and audio senses are more refined than before.

This situation creates a bit complicated roles for the schooling processes. It should change the curriculum to cope with these children and at it should also change the teaching methods.

The presentation forms of information by the new instructional technology means affected, by all means, the teaching methods and techniques used by teachers in schools. For example, the child can learn from a television program or a movie or from an interactive video or from a computer program a lesson in which information is presented much better than the teacher's presentation. Also, we cannot ignore the influence of these programs on the child behavior due to different production techniques that attract the child's attention and stimulate him. This leads to the belief that this technology opens new possibilities for the representation and presentation of information in ways that are better suited to human assimilation than methods available in the past. With instructional technology comes the possibility of representational media that are dynamic, adaptive and interactive to a degree not really feasible in the past. Bearing all these factors in mind, do we know what instructional technology means exactly? did we think seriously about instructional technology in teachers education?. Did we incorporate in teachers education programs(in some colleges of education in Arabic countries) adequate instructional technology topics in order to help teachers meet the child's needs and face their new roles? What are the new trends in instructional technology? These questions will be the focus of this paper.

Instructional technology, The definition:

To begin with, instructional technology (IT) meant and will continue to mean different things to different people. Some view IT as a particular set of instructional media, often referred to as audiovisual devices. This definition limited the field to a narrow area if study. It concentrates on the concept of teaching aids like television, films, overhead projectors, charts, maps, computer and other items of hardware and software. The second view goes beyond any particular medium or device. In this sense, IT is more than the some of it parts. It is a systematic way of designing, carrying out, and evaluating the total process of learning and teaching in terms of specific objectives, based on research in human learning and communication, and employing a combination of human and non- human resources to bring about more effective instruction (Commission on IT 1970 p.21). This definition concentrates on a systems approach. It views the field in a wider angle that contains input, process, output, outcome and purpose of the whole instructional systems. It expands the

boundaries of the field both conceptually and practically. The third definition looks to IT as an approach for individualized instruction with special emphasis on the individual learner and his unique needs (AECT 1977 p.36). By the year 1977, the Association for Educational Communications and Technology (AECT) has published a book about the definition of educational technology. It defines educational technology as a" complex, integrated process involving people, procedures, ideas, devices, and organization for analyzing problems, and devising, implementing, evaluating and managing solutions to those problems, involved in all aspects of human learning" (AECT 1977). Today this definition is the most accepted one by the people in the field. Another recent definition generated by Richey and Seels (1994) is that" IT is the theory and practice of design, development, utilization, management, and evaluation of processes and resources for learning" (p.2).This definition describes the field in terms of five domains. It replaces the definition of AECT in 1977. It can be shown as indicated in figure 1.

From the above definitions one can say that this field is changing so rapidly over time and shifting its emphasis and focus. If ones agrees on the last two definitions presented above, it is clear that IT is a major component of all human instructional activities. It plays a major role in teacher work and student learning. It helps them to do their job both effectively and efficiently. Engler

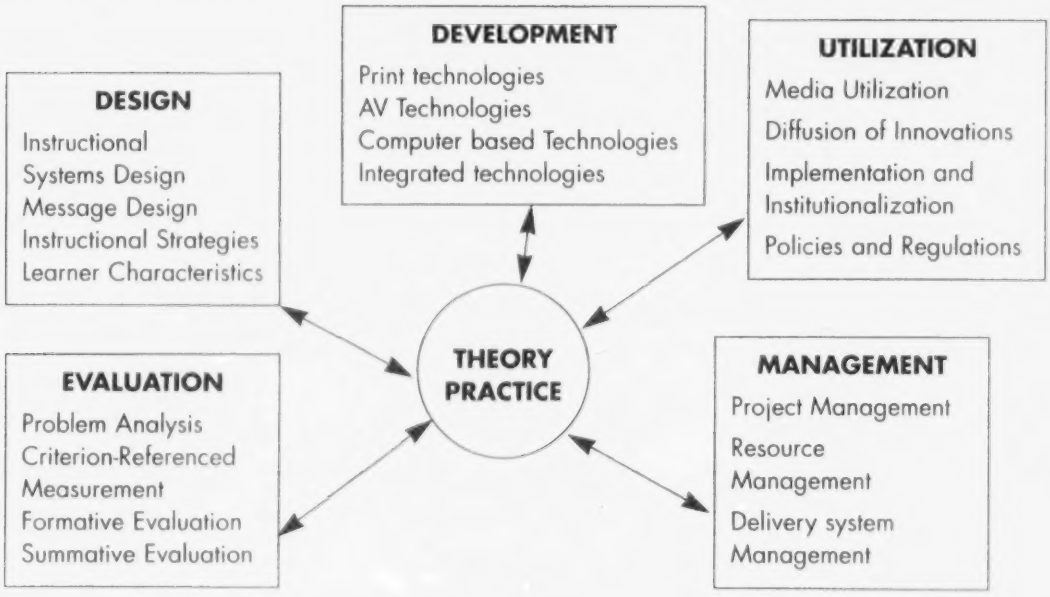

Figure 1.Domain of IT
Source: Educational Media And Technology Yearbook 1994 V.20 p.3

(1972) states that "if we view the ecology of education as the web of relationships between and among learners, teachers and the environment in which they operate, then it becomes apparent that these relationships are large defined by the prevailing technology of instruction p.62." This leads to the fact that learning and teaching are going to be more deeply affected by the new availability of information and the accompanying technology than any other area of human life. thus there is a great need for a real educational revolution which takes in consideration all aspects of the schooling processes e.g. curriculum, teacher preparation learning environment, the student, administration, educational systems structure and so on.

Instructional technology , teaching, and information:

Given that instructional technology has a place in education and training , how do we determine what that place is? How do we envision where it fits? One thing is clear they must fit into a new instructional settings in which new roles should be identified to both teachers and learners. Past lessons have shown that it is very difficult to use technology in the existing school structure. School must be thoroughly restructured to use technology wisely and well. Regardless of this statement, Johnson (1989) views the uses of instructional technology for teaching in the existing instructional settings, as a multidimensional matrix of applications of technology.

The horizontal dimension is for the level of student independence (classroom, small group, independent), the vertical dimension is for cognitive activities (presentation, practice and application, analysis and evaluation), and the diagonal dimension is for the size of the instructional unit (smaller, larger). The matrix contains nine cells. If we want to apply this matrix in the instructional process we have to train teachers about the technologies of instruction like interactive video, computer assisted instruction, personalized system of instruction, audio tutorial systems, programd tutoring, programd instruction, cooperative learning, and games and simulation. Much discussion about technology and education has focused on the question of how technology can be used to facilitate teaching and learning. But technology relates to education in many ways, the connections with educational methods being only one of them. Technology also affects the content of education, because among the objective of education is of making understandable the world in which one lives, and we live in a technological world. Education serves many purposes, one of them is preparation for work. Teachers preparation and training in IT is very urgent. The need for teacher involvement in IT is being recognized by one

of the largest teacher unions in the United states of America, the National Educational Association (NEA). NEA believes that:

Teachers preparation in IT must start at colleges and university programs and extend through continuing opportunity for professional development.

Teachers must be involved in all aspects of technology utilization including planning, implementation and evaluation.

Effective use of technology requires a licensed teacher in every classroom.

IT should be used to support instruction, but not to supplant education employees (NEA1991).

IT and information have a very successful relationship. They nurture each other. There is strong argument for using IT in the information age. We can justify why IT for information age as follows:

IT supports and accelerates systemic change for educational excellence.

IT helps to reconstruct and improve teaching.

IT expands and enriches learning opportunities

IT links school and society to improve life quality.

IT encourages lifelong learning.

However, beside the above positive statements for IT, it is impossible for IT to play its major role in information exchange at school without considering the following barriers:

School system organization needs to be restructured.

Lack of technology system support and inexperience with advanced technology.

Inadequate teacher preparation.

Insufficient support for new modes of instruction.

Narrow and outmoded instructional practices and limited access to information.

School disconnection from the society.

Solving the above problems and providing the educational system with a suitable environmental conditions for IT programs, one can expect desirable outcomes.

IT and the New Roles for teachers

Alexander (1992) states that "the main reason why it is becoming increasingly difficult to train someone adequately for the class-teacher role is that the role itself has become an impossible one to train for" (p.202). This statement is really touching the whole issue of teacher training and preparation because the requirements of teacher education is shifting and changing its emphasis according to the desired roles for teachers to play in teaching. The profession of a teacher is changing and the roles of a teacher are more and more diverse. There is a great need for defining the main roles for teachers and then prescribing the training programs to meet them. Some educators call for a competent practitioner, reflective professional and a researcher. Others call for a facilitator, designer, counselor, advisor, organizer, leader, manager, evaluator, and monitor. He has to master and manage teaching and learning. Simons quoted by Pieters (1995) describes different roles for teachers facing new challenges of learning, instruction , the new development of information and communication technology. These new roles can be presented as follows:

Teacher as an external monitor.

Teacher as an expert model.

Teacher as a leader for metacognitive aspects of intellectual functioning.

Teacher as an initiator of learning for the student.

Teacher as a self-confidence gainer and motivation promoter.

Having all the above mentioned roles and others, did we prepare teacher for these roles? Did we include IT in teacher preparation? What are the roles of IT in the training process? These and others questions are legitimate to ask. Most teacher training institutes include IT in their programs. But how would it be included? What are the components of IT? What is the weight of IT in these programs compared to other components? The answers to these questions will be discussed in the remaining part of the paper in relation to some colleges of education in Arab countries.

The sample

Four colleges were selected for the study. The selection process was made on the basis of the availability of information about the programs of these colleges. The researcher found information on four colleges only. He teaches at two of them. They were colleges of education in Khartoum University(KU) (Sudan), Sultan Qaboos university(SQU)(Sultanate of Oman), Holwan

university (HU) (Egypt)) and United Arab Emirates University (UAEU)(United Arab Emirates). These colleges offer courses in IT and other course for the student teachers as any other college of education, hoping that they help in preparing those students for their future work.

Methodology

IT course descriptions at these colleges were examined by to determine the components of each one and its weight and their numbers. The analysis shows the following:

Number of compulsory IT courses, their weight and nature

College name	number of courses	weight	nature
College of education at KU	2	5C.H.	theory and practice
College of education at SQU	1	3 C.H.	theory and practice
College of education at HU	1 (for academic year)		theory and practice
College of education at UAEU	1	3 C.H.	theory and practice

Analysis of the components of IT courses

College of education at KU offers two courses. The first course(2CH) is an introductory one which gives the conceptual frame work for the field of audiovisual aids, the evolution of the field, classification of the instructional media, instructional communication models, some production techniques and the instructional devices. The second course (3CH) is about the new technologies of instruction like programd instruction, programd tutoring, personalized system of instruction, cooperative learning, computer-assisted instruction, audio tutorial system and some limited applications on them.

The weaknesses of this program lie in the area of the production and concentration on the theoretical aspects of the audiovisual aids. It does not explore the students to the new trends in IT like interactive video, Internet, multimedia presentations and other computer software. It does not prepare the students to maximize the use of the available information technology around them. Putting more money and adding the above topics may contribute to the solution of the problem.

College of education at SQU offers one compulsory course on IT and three optional courses two of them had never been taught. The compulsory course consists of two equal parts with two teaching hours for each. One part is theoretical and the other is practical. The theoretical aspects concentrate on the basis of IT, its historical development, communication models, instructional

media in general (selection and utilization), message design, instructional devices and their associated materials, and technologies of instruction. The practical aspects deals with the production of some instructional materials like overhead transparencies, posters, slides, boards, models and some limited computers applications.

The weaknesses of IT at SQU can be attributed to allocated weight of the course (only 3 credit hours compulsory). This is not enough to prepare the students to optimally use the huge information available around them in teaching. A second course in the utilization of computer in instruction is needed. Fortunately, this course is among the optional courses but the load of the instructors in the department does not permit them to teach it. Hiring another instructor and make this course compulsory may help in solving the problem.

The college of education at UAEU offers one compulsory course in IT. It deals with the theoretical and practical parts of IT. It presents topics about the definition of IT, functions of IT, instructional communication media,(selection, utilization, evaluation) ,production of instructional materials, principles of instructional design and instructional devices and their accompanying materials. Again the same weaknesses exist. The course does not prepare the student to be a good teacher in the information dominated era. More courses are needed in the area of computer utilization in teaching.

The college of education at HU offers one course in IT but for a full academic year which means one course for each term. In HU the system is different from the other three colleges in which the credit hour system is applied. IT items in the college of education at HU are very similar to those in the college of education at UAEU. They expose the students to both theoretical and practical aspects of IT like the definition of IT its history, instructional media, communication models, instructional devices and their materials, selection, utilization, evaluation, programd instruction and production of some audiovisual aids(transparencies, slides, posters, models and the like) (Khorsheed 1997). This program has the same problems of the others; it does not prepare the students to use the information technology in their teaching process. More courses in IT are still needed in the area of computer utilization in the teaching process. The college of education at HU is unique in the Arab universities in offering a Bachelor degree in IT and information which prepare specialists in the area of IT and information.

In the college of education at HU and the college of education at KU there

is a separate department of IT and postgraduate degrees are provided, whereas in SQU and UAEU there are no separate departments for IT. IT at SQU and UAEU is a part of curriculum and instruction department.

From the above analysis one can conclude that regardless of the number of IT courses offered to the student teachers at these colleges there is a great need for more courses in the area of computer and the production techniques. If we want to have a competent teacher it is recommended to reconsider our training programs especially in the area of IT. Recently, Arab League Educational, Scientific, and Cultural Organization (ALESCO 1997) has proposed a program in the area of IT for colleges of education. In its initial proposal four courses of IT must be offered by all colleges of education in the Arab world. These courses are 1) instructional technology and communication 2) designing and producing instructional media 3) utilizing and evaluating instructional media and materials 4) computer in instruction. This is an initial and first draft proposal and we hope it will be improved and implemented in the near future.

Recommendations and suggestions

For IT to have a strong and lasting impact in teacher preparation and actual classroom instruction the following recommendations and suggestions may be considered:

1) Telecommunication systems (radio, TV, teleconferencing, Internet) should find their way to schools and teachers should be trained in using them for teaching.

2) An electronic classroom should be established in which all interactive media are available.

3) Production facilities for multimedia should be a part of any teacher preparation or training program.

4) IT courses must concentrate on both practical and theoretical aspects specially in the area of information and communication technology.

5) For colleges of education in Arab countries more courses in IT, in particular computer in instruction, should be added with especial emphasis on applications.

6) The teacher's role in the teaching and learning process should be changed with the introduction of new technologies in the school system.

7) IT should be viewed as an integral part of the learning and instructional process and not as a supplementary media.

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Learning How to Teach: Student Teachers' Perception of the Impact of Feedback from University Supervisors and Cooperating Teachers

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Introduction

The question of **when** and **how** a teacher trainee acquires the competencies and attitudes required to become an effective teacher has troubled teacher education researchers in recent years. Following Holmes Group reports of 1986 and 1990, which call for major reforms in the area of teacher education, research has looked more critically at the processes, roles and outcomes of teacher education. The area that received a lot of research attention in the last decade or so has been field experiences. Research in this area has shed light on students' occupational socialization and the way in which field experiences influence students professional perspective (Goodman, 1985; Tabachnick & Zeichner, 1984 among others). Recent research on the other hand has looked more closely at the teaching practice triad and the relationship between participants of the triad; mentor/trainee/supervisor and supervisor/mentor and the way in which they influence the development of trainees' professional skills. (Kettle and Sellars, 1996; Winitzky & Kauchak, 1995).

That field experience is the central component in the pre-service teacher education program has been an established fact for a long time. However, field experience has not always been considered to be an exceptionally educative experience. While teachers consistently rate student teaching as a single most beneficial component of their preparation, researchers have cautioned that student teaching can have both positive as well as negative consequences for prospective teachers (Zeichner, 1985). Others yet have suggested that student teaching may have little impact on teachers' development of pedagogical skills or reflective abilities (Hoover, O'Shea and Carroll, 1988).

Despite the fact that student teaching has been the most widely studied aspect of teacher education, much is still unknown about the student teaching experience, role of feedback and the influence of cooperating teachers and university supervisors on the actual process of learning how to teach (Feiman-Nemser and Buchmann, 1987).

Borko and Mayfield (1995) also suggest that much still remains unknown about the influence of University Supervisors and cooperating teachers on student teachers' learning of their professional skills. They further indicate that the effectiveness of student teaching is related to the help and guidance provided by cooperating teacher and university supervisors. Factors such as poorly defined roles, inadequate preparation for the task of supervision, infrequent visits, poor communication among others have often been cited as reasons for ineffectiveness of student teaching experience (Amer and Al Barwani, 1994).

Background of the study

At Sultan Qaboos University teaching practice (TP) is conducted in the last two semesters of the teacher education program. A one-day teaching practice session is arranged in semester 7 and a two- day session in semester 8. Student teaching in semester 7 is done only in preparatory schools while that in semester 8 is done in preparatory as well as secondary schools (one day in preparatory and one day in secondary). Normally four or five students are assigned to a given school and students get an average of 2 to 3 teaching periods per day. The rest of the time students do peer observation and observation of the cooperating teacher (CT). Each student teacher is assigned to a cooperating teacher who is expected to do mentoring functions while the student is in school. Among the prescribed roles of the cooperating teacher are to (1) discuss and give guidance on the lesson that the student teacher (ST) is planning to teach, (2) observe the lesson and give feedback, (3) evaluate the lesson using an observation form developed by the University, (4) give a score at the end of the TP session.

Between 2 and 4 university supervisors (US) are involved in teaching practice for EFL students at one given time. On average 2 University Supervisor's get to observe a given student. A student normally gets 1-2 observations in semester 7 and between 2-6 observations in semester 8 from university supervisors. For observations, University Supervisors are required to use a standard observation form to record their impression and assessments of different aspects of students' performance in the classroom. Subsequently the university supervisor totals the marks given during classroom observations and assigns 80% of the total mark for TP, leaving 10% of the marks to the school principal who is expected to evaluate the student in accordance with administrative related roles like abiding to school rules and regulations, punctuality, cooperation with school administration, etc. while the remaining 10% is left for the cooperating teacher.

Feedback is normally given to student teachers in two formats; The first is individual conferencing which takes place immediately following the

observation and the second format is the observation forms containing feedback which the ST collects from both CT and US. These forms with lesson plans form part of the documentation which ST includes in his TP folder which is expected to be submitted to the US at the end of the semester.

In general, students do very well on grades in teaching practice. The average grade in TP is B- and hardly anybody failed between 1993 and 1997. Table 1 shows TP grades in different specializations for Fall and Spring 1996-1997 and Table 2 shows EFL students grades in TP compared to other specializations combined.

While grades indicated near mastery in teaching practice, students' own reflection after graduation leads one to question the actual impact of the teaching practice experience on students learning how to teach.

Table I

STATISTICAL DISTRIBUTION OF THE GRADES OF CEIS STUDENTS IN THE TWO TEACHING PRACTICE COURSES (9 Credits Total) - FALL 1996 AND SPRING 1997

GRADE	A	B	C	D	E	TOTAL
SPECIALIZATION						
Islamic Education	3 (4.4.%)	41 (60.3%)	24 (35.5%)	0 (0%)	0 (0%)	68
Arabic Language	6 (8.6%)	48 (68.6%)	15 (22.9%)	0 (0%)	0 (0%)	70
English Language	9 (11.5%)	48 (61.5%)	21 (29.9%)	0 (0%)	0 (0%)	78
History	5 (17.9%)	20 (71.4%)	3 (10.7%)	0 (0%)	0 (0%)	28
Geography	2 (8%)	20 (80%)	3 (12%)	0 (0%)	0 (0%)	25
Home Economics	0 (0%)	14 (58.3%)	10 (41.7%)	0 (0%)	0 (0%)	24
Physical Education	7 (14.5%)	26 (54.2%)	12 (25.0%)	2 (4.2%)	1 (2.1%)	48
Art Education	5 (12.2%)	22 (53.7%)	14 (34.1%)	0 (0%)	0 (0%)	41
Science Education	0 (0%)	51 (63.8%)	29 (36.2)	0 (0%)	0 (0%)	80
Math Education	0 (0%)	45 (83.3%)	9 (16.7%)	0 (0%)	0 (0%)	54

* combined courses for Semester 7 and 8.

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TABLE II

STATISTICAL DISTRIBUTION OF THE GRADES OF EFL STUDENTS COMPARED TO OTHER SPECIALIZATIONS IN THE TWO TEACHING PRACTICE COURSES (9 Credits Total) - FALL 1996 AND SPRING 1997

GRADE	A	B	C	D	E
SPECIALIZATION					
English Specialists	11.5%	61.6%	29.9%	0%	0%
Other Specializations	6.4%	65.6%	27.4%	0.4%	0.2%

Review of Related Literature

The change from student to teacher seems to involve two forms of knowing: Knowing "that" and knowing "how". Field experience or teaching practice is a component of teacher education traditionally counted on for the application of knowing "that" and consequent development of know-how (Ravegno, 1992).

Efforts to understand know-how began in the 1980's and this was the beginning of interest in different components and interactions in field experience. Copeland (1981), Nettle (1988) and Mercer (1989) focused on the supervision process of student teachers and offered an alternative that would shift supervision of student teaching from its rigid prescriptive format to a more participatory, democratic and collaborative format.

Other research on supervision looked more closely at the instruments used to assess trainees' performance in the classroom. Faut, Hill and others (1985) looked at the criteria used to evaluate student teachers. Specifically they wanted to find out whether the criteria used was based on findings of research on effective teaching. One hundred and seventy eight colleges and universities were randomly selected and a survey instrument was developed to obtain information on the type of assessment used for students. Institutions were invited to send the list of criteria and the actual assessments used.

Results indicated that by far the most common device was rating scales though other methods like daily logs, anecdotal records, self assessments were also used. The study found 69 of the 123 institutions which responded to the questionnaire used multiple continual assessment. However, only 10% of the institutions which sent their criteria for assessment, used behavior indicators.

The most commonly mentioned factors used in assessment were lesson plans and discipline.

Hattie, John and Others (1982) on the other hand wanted to investigate whether classroom supervisors can rate student teachers reliably and to determine the criteria which is deemed important. Supervising teachers were asked to rate their supervises on different factors. Findings showed that supervising teachers could reliably rate students. Their findings also showed that supervisors mainly concentrated their assessment on two major factors namely: Preparation and Presentation.

Although the supervisory process has various complexities, feedback was considered to be a "key ingredient" to the success of teaching practice. Thus, the same period witnessed a shift in attention to the feedback process. Christensen (1987) conducted a study to investigate the supervisory process and to identify the nature of feedback that student teachers receive from their university supervisors. His sample consisted of 9 university supervisors and 20 student teachers. Data was collected by audiotaping conferences and interviewing all subjects after the conference sessions. Results indicated that during feedback, supervisors' comments were evaluative in nature. This was portrayed in that feedback prompted critical thinking about the observed lesson, comments tended to connect what was observed to teaching strategies and learning principles, and feedback used supportive data about what the student teacher did during observation. Student teachers indicated that the feedback they received was reflective and their supervisors made them comfortable about explaining their reasons for doing what they did during the observation. Findings also indicated that University Supervisors gave little direction and acknowledgment. "Teaching" comments were also seen to be the predominant comments in the feedback.

Hoover and O'Shea (1987) investigated the influence of supervisory variables on classroom performance of student teachers and the student teachers perception of the quality of supervisory feedback under different conditions. The sample included 26 student teachers, 23 cooperating teachers and 8 university supervisors. The three sub-samples were randomly assigned to one of six cells in the experimental design. Findings showed that collaborative conferencing did not exert a stronger influence on student teachers classroom performance than did the traditional two-way conference. Similarly, the different modes of feedback did result in significantly different rates of implementation.

Zeichner (1980) examined arguments related to two popular yet contradictory myths concerning the value of field-based experiences in pre-service teacher education. Among the myths that he assessed is one which says, "Practical school experience necessarily contributes to the development of better teachers". On this myth Zeichner indicates that the findings are confusing and inconclusive. He comments however, that literature review has shown field experience to entail a complicated set of both positive and negative consequences and that specific situational constraints and internal resources of individuals are to a large extent responsible for the development of teaching perspectives. A wealth of evidence indicates that student teachers often move closer to the attitudes and behaviors of their cooperating teachers by the end of the student teachers experience. Though it is believed that the cooperating teacher has been the primary source of convergence, the relationship between the cooperative teacher and student teachers is influenced by shaping forces exerted on both by the ecological system of the classroom and the school.

On the same line as Zeichner, Yee (1969) examined the influence of cooperating teachers on student teachers attitudes. In testing the hypothesis about attitudes which influence student teachers, Yee found that student teachers shifted their attitudes to approximate more closely the attitudes of their cooperating teachers.

In more recent research, Luz and Gonzalez (1996) examined the cooperating teacher's and student teacher's interpretation of the same teaching event in order to test the general belief that the cooperating teacher has substantial influence on the development of student teachers orientations, dispositions, conceptionary and classroom practices as indicated by Griffin 1986, Olson and Onter 1989, Zeichner 1986 and Zimpher 1987. After analyzing interview data collected from 13 cooperating and student teachers the results indicated that while the student teacher and cooperating teacher recognize the same events as salient in a student teaching experience, they interpret these events in quite different ways.

Bowman (1979) on the other hand challenged yet another widely held belief that the university supervisor has a great influence upon the achievement of the student teacher during teaching practice. Considering the number of trainees that a supervisor is responsible for and visits that a university supervisor can make to an individual trainee, together with and the amount of feedback time that is actually available, Bowman maintains that a student can

do without the university supervisor. He suggests that with improved status, some training, and few incentives, the cooperating teacher will be able to give more effective guidance to the student teacher compared with the university supervisor. He suggests that funds, energy and time can be better utilized by making university supervisors resource consultants who would bring new and developing techniques for dealing with current problems of school.

Kremer-Hayon and Wobbles (1990) conducted a study to investigate the interpersonal relations between student teachers and cooperating teachers and student teachers satisfaction with the supervision. Two separate questionnaires were developed and administered to 113 student teachers in Israel. Seven of the eight factors studied in the interpersonal scale were found to be statistically significant and highly correlated with student teachers satisfaction. The general tendency indicated that cooperative styles were positive while styles which involved opposition were negative. This he says, indicates problems of communication, which are likely to be demanding and quite perplexing to both parties.

Borko and Mayfield (1995), explored the influence of both university supervisors and cooperating teachers in learning to teach. Specifically the study looked at the conferences between student teachers and their university supervisors and cooperating teachers and the perceived influence of these conferences on student teachers knowledge, beliefs and classroom practice. Using interviews and observations, data was collected from four student teachers, 3 University Supervisors and 12 cooperating teachers. Findings revealed that the length of the conferences varied between 5 to 30 minutes and the domains covered were: pedagogy, students, subject specific pedagogy and subject matter. Large differences existed in the depth and specificity of discussions. Results further indicated that cooperating teachers seemed generally satisfied with their relationship with student teachers and student teachers were generally dissatisfied with university supervisors. Student teachers criticism was based on the fact that supervisors visited classrooms too infrequently and therefore had limited knowledge about their teaching. These findings are in line with Bowman's findings. Amer and Al Barwani (1994) conducted a study of EFL student teachers and their cooperating teachers in order to determine the cooperating teachers' awareness of their roles and responsibilities and the student teachers perceptions of the role and responsibilities of the cooperating teachers. Findings of the study support Gonzalez (1996) contention regarding cooperating teacher and student teachers lack of communication and understanding of each others roles and

perceptions. On the same line as Amer and Al Barwani, Abell and others (1995) conducted a study to illuminate mentor and intern's relationship in a beginning teacher internship program. Interview data from 29 mentors and interns were analyzed to identify how mentors and interns identified their roles. Findings of the study indicate that mentors and interns jointly construct their relationship and that the relationships are underguided by the respect and trust that the two individuals have for each other. Furthermore, interns appear to need mentors who support them, assume flexible roles and who adapt their roles based on interns needs.

In the last two to three years, research seems to focus more closely on the professional development of teachers. Cope, Inglis and Stronach (1997) conducted a study which focused on the nature of support student teachers receive while in school. This support is considered critical in their transition from student to teacher. Analysis of interview data and narratives collected from 22 student teachers revealed that the amount of observation and feedback received from cooperating teachers varied. The important aspect of the feedback to students was its quality which is experienced by students as relating to how rather than what criticism is conveyed. Their study concludes that relations are of great significance and that teachers provide help (or not) but in a variety of forms; teaching tips are valued but typically different for different students in different situations. In summary, what seems to emerge in all these research attempts seems to indicate what Graham (1997) concluded in her study that the student teaching experience is based upon a highly personalized relationship particularized by the cumulative experiences of the mentor and student teacher and university involved in partnership and, the school and department culture in which they work.

Rationale

In order for us to begin to understand the significance of teaching practice to our students, we need to study the supervisory process, individuals involved in it and the feedback that they actually give to student teachers.

Considering that the College of Education and Islamic Sciences at Sultan Qaboos University has a comparatively new teacher education program, the research base on field experience is almost non-existent. This research intends to provide decision-makers with research data necessary for objective decision making in field experience.

Over a decade after the establishment of the College of Education, and

institution of the teaching practice program, no one has critically looked at the practices and assessed the actual value accrued from such practices. This study will hopefully provide data that can be used in evaluation of the teaching practice program.

Purpose of the study

The purpose of the study is to have a better understanding of the role of field experience (Teaching Practice) in developing professional skills. Specifically, the purpose of the study is to explore student teachers' perceptions regarding the contribution of university supervisors and cooperating teachers in their process of learning how to teach. The study also looks at the role of feedback that the student teacher receives from both the University supervisor and cooperating teacher.

Research Questions

The study set out to answer the following research questions:-

1. What expectations do student teachers have of TP in general and the contribution of Cooperating Teacher (CT) and University Supervisor (US) in particular in their classroom performance?
2. What kind of feedback does a ST receive from CT and US?
3. What is the student teachers perception of the impact of the feedback from CT and US on classroom performance?
4. Is there a difference in student teachers perception of feedback received from cooperating teachers and university supervisors?
5. How much contribution did cooperating teachers and university supervisors actually have on the student teacher's learning how to teach?

Method:

The sample of the study comprised of 32 English as a Foreign Language (EFL) student teachers in their 7th and 8th semesters.

Data was collected using interview schedules (pre- and post-TP) and a feedback questionnaire.

1) Interviews were conducted with 12 randomly selected student teachers a few weeks before the start of teaching practice. The purpose of this interview was to elicit their expectations of teaching practice and the anticipated contribution of cooperating teachers and university supervisors

in their learning how to teach. Precisely, the questions asked were:-

a) What contribution do you think teaching practice is going to have to your process of learning how to teach?

b) What are your fears regarding teaching practice?

c) What do you envision would be the roles of US and CT in teaching practice?

2. A questionnaire adapted from Hoover and O'Shea (1987) was used for the purpose of soliciting information regarding student teacher's perceptions on feedback received. The original questionnaire consisted of 41 items concentrating on feedback received from university supervisor. After eliminating and rephrasing some items, 24 university specific items were used and 17 new items were developed for cooperating teachers. This was done in such a way that comparison between the two sources of feedback that student teachers receive, could be made.

3. Post teaching practice interviews were conducted with 5 randomly selected students to solicit their opinions regarding what had actually happened during teaching practice. The interview questions focused on:-

a) In retrospect, what was the contribution of teaching practice in student teachers learning how to teach.

b) What was the actual contribution of CT and US in learning how to teach.

c) What are the major obstacles that student teachers faced during teaching practice.

d) What suggestions would student teachers like to propose in order to make TP more meaningful.

Analyses

Pre and Post teaching practice interview data was analyzed using qualitative methods. Student teachers' expectations, fears and experiences, merged as data was examined. Categories of responses were developed for each of the questions raised in the two interview sessions.

The feedback questionnaire data was analyzed using descriptive statistics while differences between perceptions of feedback from cooperating teachers and university supervisor were analyzed using t-tests.

Results

Twelve students responded to the Pre-TP interview in which their perceptions towards TP were solicited. The first question was on the contribution that student teachers thought teaching practice was going to have to their learning how to teach. In other words, what benefit did student teachers expect to gain from teaching practice? The responses can be grouped into the following eleven categories as can seen on table III.

Table III

STUDENT TEACHERS EXPECTATIONS OF THE TEACHING PRACTICE

NO.	ITEM	FREQ.	PERC.
1	I will be able to learn to teach by observing and imitating experienced teachers.	4	13.8
2	It will give me various competencies that I will need as a teacher like handle students, prepare lessons, write exams, etc.	2	6.9
3	It will give me an experience in the classroom.	5	17.2
4	It will enable me to correct my mistakes through feedback.	2	6.9
5	It will build my personality.	4	13.8
6	It will enable me to improve my teaching.	2	6.9
7	It will force me to read beyond the information presented in the book.	2	6.9
8	It will develop my language.	2	6.9
9	It will enable me to find my strengths and weaknesses.	2	6.9
10	It will give me a chance to experiment my own methods of teaching English.	2	6.9
11	It will expose me to the school.	2	6.9

Results indicate that student teachers have very high expectations towards teaching practice and that they perceive it to be a medium through which they learn how to teach, where they can correct their mistakes and improve their language skills.

The second question looked at student teachers expectations towards the

contribution of the cooperating teacher in learning how to teach. Table IV illustrates students responses on this question.

Table IV

STUDENT TEACHERS EXPECTATIONS TOWARDS CONTRIBUTION OF COOPERATING TEACHERS

NO.	ITEM	FREQ.	PERC.
1	I will try to learn as much as I can from her.	3	5.9
2	I will rely on him for advice and guidance regarding students, lesson preparation and presentation.	7	13.7
3	I want to have a good relationship with my cooperating teacher	4	7.8
4	I want to be able to consult her when I have problems.	5	9.8
5	I fear I will not get sufficient guidance.	2	3.9
6	I will not have a close relationship.	2	3.9
7	I will have a strong relationship with my cooperating teacher because he has more experience and knowledge of the school environment.	3	5.9
8	I will cooperate with her.	1	1.9
9	I will be open to criticism because I want her to point to my mistakes so I can correct them.	6	11.8
10	I may not accept everything he says.	2	3.9
11	I will be friendly so I can learn from him and get a good assessment.	3	5.9
12	I want to benefit as much as I can.	4	7.8
13	I want him to be comfortable with me so I get from him everything he knows.	2	3.9
14	The cooperating teacher will be more important than my University Supervisor.	3	5.9
15	I will ask for his honest feedback.	4	7.8

As can be noted from the table, the majority of the responses seem to indicate that student teachers look at cooperating teachers as role models from whom they will learn what needs to be known about the teaching profession.

With the exception of few, student teachers wanted to have warm and positive relations with their CT so that they could learn from them.

The third question dealt with the anticipated role of the University Supervisor in the process of learning how to teach. Table V shows students expectations towards the contribution of US.

Table V
ANTICIPATED CONTRIBUTION OF UNIVERSITY SUPERVISOR

NO.	ITEM	FREQ.	PERC.
1	I do not expect a significant role from University Supervisor.	3	12.0
2	I will depend on him only when it comes to the handling of content area.	3	12.0
3	Since the University Supervisor is the one who determines my grade, I will need to implement his opinions.	5	20.0
4	I expect more guidance from the University Supervisor.	1	4.0
5	I suspect he could act as sounding board for opinions received from cooperating teacher.	1	4.0
6	I cannot build a strong relationship with the University Supervisor.	1	4.0
7	I will ask guidance about the best methods to use with students.	3	12.0
8	I will consult him on different issues related to my teaching.	3	12.0
9	He possesses both theoretical and practical experience.	2	8.0
10	I will seek guidance concerning psychological problems.	3	12.0

Compared to the anticipated role of cooperating teachers, student teachers seem to expect little less from the university supervisor. As can be noted on the table, the most frequent response given was related to the fact that the student teacher had to comply with the university supervisor 's suggestions because he has the bulk of the marks which make up the TP grade.

Unlike the responses given for cooperating teachers, here the responses are rather mixed indicating some positive as well as negative expectations.

On looking at the worries and apprehensions that student teachers might have prior to TP, analysis of the interview data revealed 18 categories of worries as can be seen on Table VI.

Table VI

APPREHENSIONS PRIOR TO TEACHING PRACTICE

NO.	ITEM	FREQ.	PERC.
1	Forgetting information that I am going to teach.	1	1.7
2	Whether I will succeed in getting students to respect me.	4	6.8
3	Whether CT will render the help and guidance that I will need.	5	8.4
4	Will I have a good relationship with other teachers?	1	1.7
5	Will I be able to use the right methods?	4	6.8
6	Will I be a successful teacher?	2	3.4
7	The University Supervisor may not be supportive.	2	3.4
8	I may have problems with classroom control.	7	11.9
9	I may not be able to answer students' questions.	4	6.8
10	I may mispronounce words.	4	6.8
11	My students may have better language abilities than myself.	5	8.4
12	I may have problems handling weak students.	1	1.7
13	I may not be able to convey what I want to convey to my students.	4	6.8
14	I am scared of committing mistakes.	2	3.4
15	I may not be able to impress my students.	5	8.4
16	I fear assessment of other teachers.	1	1.7
17	I am worried about my language fluency.	3	5.1
18	I fear confrontation with students.	4	6.8

Classroom control seems to loom large on the student teacher's list of worries. It may be noted here that male student teachers were the ones who were more worried about classroom control than their female counterparts. Inability to impress students and uncertainty about whether the CT will cooperate or not are some of the more frequently mentioned worries. Of similarly high concern was students worry about their language ability and their level of proficiency in comparison to their students.

With regards to the feedback questionnaire, the items were analyzed separately for US and CT. Table VII shows student teachers perception towards the **actual** feedback received from university supervisors.

Table VII

STUDENT TEACHERS PERCEPTION OF FEEDBACK RECEIVED FROM UNIVERSITY SUPERVISOR (US)

	FEEDBACK	MEAN	STDEV.	RANK
13.	The feedback of University Supervisor was helpful	4.226	0.617	1
1.	I receive feedback very often from US.	4.156	0.859	2
8.	The strengths identified by University Supervisor were important.	4/129	1.118	3
17.	I feel neutral about my feedback session .	4.129	0.763	4
7.	When discussing weakness the University Supervisor discusses very specific examples of events.	4.065	1.063	5
6.	When discussing my strengths the University Supervisor gives specific examples from events in the lesson.	3.968	0.836	6
9.	Weaknesses identified in my lesson were important.	3.793	1.236	7
23.	When giving feedback the US lacked reality.	3.742	1.154	8
22.	The feedback I received was clear.	3.677	0.945	9
4.	I think my number one strength is my lesson organization.	3.655	1.111	.10
11.	The feedback session made me feel neutral.	3.548	0.925	11
14.	The suggestions for improvement were very general.	3.531	1.047	12
24.	The suggestions made for improvement will probably work.	3.467	0.730	13
2.	My number one strength according to US is lesson organization.	3.464	0.962	14
12.	My role in the feedback session is that of co-worker.	3.433	1.675	15
5.	I think my number one weakness is classroom management.	3.300	1.393	16
15.	The suggestions for improvement were somewhat specific.	3.100	0.923	17
18.	The observation and feedback for my teaching is important because I can always improve.	3.063	0.435	18
3.	My number one weakness according to US is my lesson organization.	3.000	1.247	19
16.	Based on my feedback I know generally what to do.	2.935	1.031	20
19.	The feedback received improved my class management.	2.800	0.714	21
10.	The scope of the feedback I got from US was adequate.	2.556	0.751	22
20.	The feedback indicated that my teaching is a little better than what I thought.	2.097	1.165	23
21.	During the feedback my mood was somewhat high.	2.000	.0730	24

The results of the section of the questionnaire which is related to US reveals very high means ranging between 2.00 at the lowest end to 4.226 at the high end. This seems to indicate positive perception towards the feedback student teachers actually receive from university supervisors. From the above responses one could deduce that even though university supervisors pay very few visits to the student teacher, their feedback seems to be more forthcoming and highly valued by the student teachers. In the contrary, a look at Table VIII indicates slightly lower means in the items related to cooperating teachers feedback with the high mean being 3.929 and the lowest being 2.179.

Table VIII
STUDENT TEACHERS PERCEPTION OF FEEDBACK
RECEIVED FROM COOPERATING TEACHERS (CT)

	FEEDBACK NO.	MEAN	STDEV.	RANK
40.	When giving feedback my cooperating teacher looked at things from a realistic point of view.	3.929	1.016	1
41.	The suggestions made for improvement by my CT definitely will work.	3.75	0.887	2
34.	My role in the feedback session with my CT could be termed as a co-worker.	3.679	1.634	3
26.	The number one strength discussed by my cooperating teacher focused upon my lesson organization.	3.586	1.053	4
38.	The feedback I received from my cooperating teacher improved my classroom interaction.	3.409	0.734	5
27.	The number one weakness discussed by my CT focused on response to students.	3.385	1.359	6
35.	Frankly the feedback I got from CT was helpful.	3.345	1.01	7
28.	When discussing my strengths with CT examples events in the class were somewhat specific.	3.172	1.197	8
25.	I received feedback from my CT only sometimes.	3.094	1.279	9
30.	The strengths identified by CT in my lesson were ones that I thought were somewhat important.	3	1.309	10
39.	In terms of really understanding it, the feedback from my CT was somewhat clear.	2.786	1.371	11
31.	The weaknesses identified by my CT in my lesson were ones I think are somewhat important.	2.75	1.206	12
37.	If anything the feedback sessions with CT were a little formal.	2.704	1.103	13
33.	The feedback sessions with CT made me feel neutral.	2.69	1.257	14
29.	When discussing my weaknesses with my CT, examples from events in the lesson were somewhat general.	2.679	1.056	15
36.	The suggestions made for improvement by my CT were somewhat specific.	2.448	1.378	16
32.	The scope of feedback I got from my CT was somewhat important.	1.179	1.09	17

Items related to cooperating teachers seem to indicate also that cooperating teachers had infrequent observations and feedback, their suggestions were considered to be Important, practical and specific and student teachers seem to think that suggestions given by them were practical and realistic.

In order to investigate how significant the difference is between the two sets of feedback that student teachers receive, paired sample t-test was used. Table IX shows that there was significant difference in ten out of the 17 comparisons that were done.

Table IX

PAIRED SAMPLE T-TEST FOR DIFFERENCE BETWEEN MEANS OF COOPERATING TEACHERS AND UNIVERSITY SUPERVISORS

VARIABLES	MEANS	STDEV.	T VALUE	P LEVEL
Feedback 1 Feedback 25	1.181 3.09	0.86 1.28	-4.56	0.001
Feedback 2 Feedback 26	3.40 3.64	0.96 1.04	-0.78	N.S.
Feedback 3 Feedback 27	3.00 3.32	1.29 1.35	-1.14	N.S.
Feedback 6 Feedback 28	4.00 3.25	0.86 1.14	2.88	0.01
Feedback 7 Feedback 29	4.04 2.70	1.09 1.07	5.00	0.001
Feedback 8 Feedback 30	4.14 3.00	1.15 1.33	3.62	0.001
Feedback 9 Feedback 31	3.92 2.73	1.16 1.25	3.32	0.001
Feedback 10 Feedback 32	2.50 2.19	0.71 1.10	1.14	N.S.
Feedback 11 Feedback 33	3.64 2.68	0.92 1.28	2.38	0.05
Feedback 12 Feedback 34	3.37 3.63	1.69 1.64	-0.68	N.S.
Feedback 13 Feedback 35	4.25 3.32	0.65 1.02	4.04	0.001
Feedback 14 Feedback 36	3.55 2.45	1.09 1.38	3.20	0.01
Feedback 15 Feedback 37	3.12 2.65	0.99 1.09	1.42	N.S.
Feedback 19 Feedback 38	2.70 3.40	0.80 0.75	1.14	0.01
Feedback 22 Feedback 39	3.40 2.74	0.99 1.38	3.38	0.01
Feedback 23 Feedback 40	3.85 3.93	1.20 1.04	-0.24	N.S.
Feedback 24 Feedback 41	3.54 3.81	0.76 0.90	-1.13	N.S.

A significant difference at ≤ .001 (t-value - 4.56) was found between feedback 1 and 25 which indicates the difference in the frequency of the feedback received from the CT and the US. US seem to visit less often but whenever they do, they tend to give significant feedback. On the contrary, CT are in school with ST all day, but their feedback seems to be less forthcoming. Another significant difference at ≤ .001 (t = 5.00) was with feedback 7 and 29. This item deals with the nature of feedback. While CT discuss students weaknesses in a general manner, US give very specific examples of events which indicate weakness. Similarly, feedback 8 and 30 which has t-value of 3.62 and P level of ≤ .001 was significant. Here the difference is in the perceived importance of the feedback on strengths of the lesson as given by the CT and US. Student teachers perceive the lesson strengths identified by US to be very important while those identified by CT to be only somewhat important.

Tables X and XI present the analyses of the Post-TP interviews conducted on 5 randomly selected student teachers. Among the questions addressed here are:-

1) What contribution did teaching practice have on learning how to teach?

2) What was the contribution of CT and US in learning how to teach?

3) What are the major obstacles that you faced during TP?

4) What suggestions would you like to make to improve TP?

Table X

POST TP PERCEPTION OF CONTRIBUTION OF TEACHING PRACTICE IN LEARNING HOW TO TEACH

NO.	ITEM	FREQ.	PERC.
1	Prepared us to be teachers	4	17.4
2	I learnt how to prepare my lesson.	2	8.7
3	I learnt how to deal with students.	2	8.7
4	I gained confidence.	1	4.3
5	I learnt how to interact with students	2	8.7
6	I was treated as a teacher.	2	8.7

One notes here that student teachers are now in a position to realistically assess TP. It is obvious from their responses that they perceive the experience as being important in their overall preparation to teach.

However, when we look at the obstacles that they faced during TP their responses concentrated on the following:-

Table XI

OBSTACLES THAT STUDENT TEACHERS FACED DURING TP

NO.	ITEM	FREQ.	PERC.
1	Very few visits from US.	4	25
2	It was too short to be helpful.	4	25
3	Many of the roles were not covered due to the short TP session.	1	6.25
4	Did not get the benefit I expected from CT.	3	18.75
5	I could not apply many of the methods I learnt in micro-teaching.	1	6.25
6	I was not treated like a real teacher.	1	6.25
7	I was not really welcome by the other teachers.	2	12.5

It is obvious here that student teachers found TP to be too short, US visits to be too infrequent and the cooperating teacher not to have contributed as much as was expected.

The question on the actual contribution that CT and US had on their learning how to teach was answered in a generally positive manner - They all thought that US and CT had significant roles to play though differences in experiences could be identified. Responses seemed to differ mainly in the quality and quantity of feedback offered and this seemed to be attributable to the CT involved, the school environment, the personality of ST and a number of other ecological variables surrounding the student teachers.

When student teachers were asked to give their suggestions for improving TP and the feedback process, responses could be categorized in 12 categories as shown on Table XII.

Table XII
SUGGESTIONS TO IMPROVE TP

NO.	ITEM	FREQ.	PERC.
1	More visits from University Supervisor.	5	20.8
2	Feedback to be more specific.	1	4.2
3	It would be better if longer period was assigned to feedback.	1	4.2
4	We need to be treated like real teachers rather than student teachers.	2	8.3
5	Cooperating teachers need to take their responsibility seriously.	1	4.2
6	Cooperating teacher should give us feedback more often.	2	8.3
7	More exposure before starting TP.	1	4.2
8	More discussion sessions with US.	2	8.3
9	More guidance to lesson plans before teaching.	2	8.3
10	Video tape our lesson so we can better understand our weaknesses.	1	4.2
11	More teaching practice preferably continuous.	5	20.8
12	We need to be given the dos and donts of handling a class.	1	4.2

The table shows what ST believe to be issues that need to be taken care of in order to improve the teaching practice process. High on the list is the need to have more visits from US and the assignment of longer period for TP.

Conclusion

The purpose of the study was to investigate the contribution of university supervisors and cooperating teachers in student teachers learning how to teach. Specifically the study focused on the role of feedback that student teachers receive from both US and CT.

The study has shown that student teachers have high expectations of TP and expect an important and positive contribution from both US and CT though significantly higher expectations were indicated with regards to the role of CT. These result seem to be in line with findings of previous research (Borko and Mayfield 1995, Amer and Al Barwani, 1994).

The feedback received during TP erased some of the optimism as well as some of the fears. In general US conducted less visits but gave more significant and meaningful comments. CT on the other hand was available but the

feedback provided was less frequent and somewhat more general. Here the results seem to support findings in Cope Inglis and Stronach (1997) who indicate that student teachers care about the quality and manner in which feedback is presented.

The post TP interviews revealed like previous research that student perception of the role of TP and feedback in learning how to teach largely depends on the length of TP, type of CT, the school environment, the personalized relationship between student teacher and the ecological variables surrounding them (Zeichner, 1980 & Graham, 1997).

Based on the result, one can conclude here that further research is required in order to identify those ecological and school variables that would be conducive to better learning how to teach.

Recommendations:-

In order that teaching practice becomes an effective tool for teaching students how to teach and in order that CT and US become active contributors to the process, it is suggested that:-

1. Cooperating teachers are exposed to their roles and responsibilities prior to being assigned the task.
2. Selection of cooperating teacher needs to be on the basis of an established criteria which emphasizes among other things merit, experience, motivation and interest to develop the profession.
3. The feedback process has to be organized in a way that would have a positive impact on the student teacher.
4. Student feedback should be given on the lesson plan and classroom performance and language element-dealing with general as well as specific aspects of the lesson.
5. Since University Supervisors cannot supervise students as frequently as they should, it is best that the larger responsibility is left in the hands of the cooperating teacher. The university's role would then be to organize workshops for cooperating teachers, establish a system which would ensure a smooth flow of feedback , install a mechanism for evaluation and supervise the whole process.
6. The ecology and school environment need to be among the most important criteria in selecting schools that would be involved in TP.
7. In order for TP to become effective and meaningful, continuous or block teaching practice will need to be adopted.

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An Evaluation of the Teacher Education Program at Sultan Qaboos University: Graduates' Performance and Perceptions

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This study deals with teacher preparation program evaluation through the perspectives of teachers, supervisors, and principals - an area of evaluation, which is far from being adequately researched both in the Arab world and in the world at large.

Many criticisms have been directed against current systems of teacher preparation in the Arab world (e.g. Turki, 1988; Hassan, 1989) and elsewhere (e.g. the Holmes Report, 1995; Goodman, 1996). Central in these criticisms have been the questions:

a) Are our systems of teacher preparation, especially the university - based, designed in such a manner as to initiate change rather than to preserve the status quo?

b) Are the curricula taught geared to the real needs of teachers, schools and society in terms of content?

c) Are those systems keeping pace with the rapid advances in knowledge and technology that characterize the present era?

Rationale of the study:

The need for a study that looks into the effectiveness of the teacher preparation program at S.Q.U. stems from a number of factors:

a) A series of workshops involving graduates of different specializations, together with supervisors and school principals were held at the university to exchange opinions with University staff with regard to the difficulties facing graduates in the field. Those workshops indicated many inadequacies in the preparation of teachers, both in the theoretical and professional domains, and were organized in response to complaints from graduates and school administrators, touching on various aspects of the preparation program.

b) No studies have been conducted that aim at assessing on the job performance of graduates of C.E.I.S by supervisors and principals.

The present study constitutes one part of a comprehensive longitudinal study conducted by the Educational Research Center at C.E.I.S, which examines a number of variables influencing the performance of new teachers.

Purpose of the study:

The study is intended to evaluate the effectiveness of the teacher preparation program at C.E.I.S. as perceived by teachers, supervisors, and school principals.

Research Questions:

The questions raised in this study are:

1) How do new teachers graduating from Sultan Qaboos University evaluate their acquisition of essential teaching competencies?
2) How do principals evaluate the actual performance of the new teachers graduating from Sultan Qaboos University?
3) How do supervisors evaluate the actual performance of the new teachers graduating from Sultan Qaboos University?
4) How do principals and supervisors differ with regard to their ratings of the performance of new teachers?

Review of literature:

Review of research on evaluation of teacher preparation programs indicates that the majority of studies express a growing concern over the quality of those programs, and over the extent to which they respond to the needs of the teacher and the student. (e.g. the Holmes group report, 1986, 1995; Corrigan, 1984; & Lanier and Little, 1986).

The major issue addressed by those studies is whether the teacher preparation programs are in accord with the challenges met in the classroom.

On the other hand, few studies reported findings that are not in agreement with the general trend (e.g. Grossman and Richert, 1988; Goodman et al, 1993). The results of those studies suggest in general that new teachers acknowledge coursework and teaching practice as influential factors in their preparation.

Other studies seem to be more concerned with basic competencies of teaching and to what extent they are possessed by new teachers (e.g. Boulianne & Weston, 1987; Bennett, 1988, Abdel Razek and El-Shibiny,

1986, Al Barawani, 1992). The present study falls within this last category for it seeks to identify competencies in which new teachers are deficient.

The literature review indicates that the practice of evaluating programs through teacher's perspectives is gradually gaining recognition (e.g. Lewis, 1982; Sheriff, 1990; Fradd and Lee, 1997). A number of studies have relied exclusively on teachers' self - evaluations (e.g. Scales, 1993; Fradd and Lee, 1997). Teachers' perspectives have proved to be very valuable in program development and improvement.

Besides teachers' self-evaluations, evaluations of programs by supervisors and principals are considered to be reliable indices of teacher performance by many writers (e.g. Damah, 1984; Natriello, 1990). However, the Holmes group reports of 1986 and 1995 do not seem to share this point of view. The reports accuse principals with other education authorities in the U.S. of downplaying teachers' professionalism, even while paying lip service to the concept. So it would appear that principals' evaluations of teachers are not generally accepted as an authentic source of information. Supervisors, on the other hand, it would appear, are in a better position to judge the performance of teachers because they constantly observe their teaching behavior in the classroom. So from the standpoint of objectivity, the ratings of supervisors are better indices of teacher behavior.

METHOD

Subjects

The study sample was drawn from school principals, supervisors, and teachers. The research sample of 234 graduates involving 94 males and 149 females was drawn from graduates of 1990/91/92. This sample represented 33.66% of the total population. The second sample comprised 128 principals (63 male and 65 female) who were in charge of the schools in which the graduates were posted. The third sample was made up of 99 supervisors who supervised the graduates' classroom performance.

Instruments

The study employed three five - point Likert – type rating scales, one for each of the three groups (principals, supervisors, and teachers). The principals' scale consisted of 17 items, whereas the supervisors' scale included 33 items covering six dimensions of performance:

- Teaching time.

- Teaching methods.
- Management of students behavior.
- Monitoring student performance.
- Feedback to students.
- Employment of teaching facilities.

The teachers' questionnaire, on the other hand comprised forty-one teaching competencies covering the six dimensions mentioned above. Each respondent was asked to rate his degree of agreement with each item on two dimensions namely importance and mastery.

The reliability of the scales was calculated using Cronbach Alpha. The values were as follows:

- 0.95 For The principals' questionnaire (17 items)
- The supervisors' questionnaire:

a) 0.86 for the first dimension (4 items)

b) 0.87 for the second dimension (5 items)

c) 0.94 for the third dimension (11 items)

d) 0.83 for the fourth dimension (4 items)

e) 0.87 for the fifth dimension (4 items)

f) 0.86 for the sixth dimension (5 items)

- The teachers' questionnaire:

a) Importance 0.94

b) Mastery 0.93

c) Discrepancy 0.94

Results and Discussion:

1. *Principals evaluation of the performance of new teachers graduating from S.Q.U.:*

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TABLE (1)*

Means and standard deviations of Principals Ratings of new teachers graduating from S.Q.U.

[5=excellent, 4=very good, 3= good, 2=pass and 1= poor]

NO	Performance Items	Mean	Stdev.	rank
1	Establishing good relations with students.	4.11	0.81	4
2	Establishing good relations with colleagues	4.20	0.80	1
3	Using variety of teaching methods.	3.65	0.76	12
4	Employing relevant teaching aids	3.44	0.83	16
5	Development of student's thinking abilities	3.40	0.80	17
6	Development of study skills of students.	3.49	0.79	15
7	Development of students attitudes and interests toward subject matter.	3.65	0.83	12
8	Knowledge of educational and psychological principles that are essential for understanding the nature of the teaching learning process.	3.70	0.85	11
9	Respect for colleagues in the profession of education.	4.12	0.84	3
10	Interests and their impact on his role as a teacher.	3.91	0.85	7
11	Ability to use scientific thinking to deal with problems.	3.55	0.79	14
12	General accomplishment of work.	3.90	0.78	8
13	Fair treatment of students.	4.16	0.81	2
14	Effective interaction with students, colleagues, parents and community members	3.97	0.90	6
15	Execution of non-teaching duties if assigned or felt the need for.	3.89	0.94	9
16	Abidance by rules, policies and principles.	3.98	0.83	5
17	Adoption of a plan for professional development.	3.74	0.80	10
	TOTAL	3.82	0.60	

Table (1) indicates that mean ratings of teacher's performance in the different items ranged from 4.20 to 3.40,with four items having an average rating equivalent to "very good" (mean=4 or more), and the rest 13 items were rated as good (mean=3 or more). It is interesting to note that the four items, which were rated as "very good", were the items concerning relations with students, colleagues in the school and in the profession. The least-rated items were: development of student's thinking abilities, employment of relevant teaching aids, and development of study skills of students.

* The items in Tables (1) through (8) are English translations of the questionnaires which were originally in Arabic

2.Supervisors' evaluation of teachers' performance:

As already explained, supervisors were asked to evaluate the performance of new teachers on 33 items categorized into six dimensions, namely: time management, students' behavior, lesson presentation, maintaining student learning, learning feedback, and learning facilitation.

The results are presented in Tables (2) through (8). Table (2) indicates that the time management ability of new teachers as seen by supervisors is quite good with means falling within the range 3 to 4 and an overall mean of 3.72. Supervisors rated the new teachers' ability to control student behavior as fair with a mean of 3.51 as shown in Table (3). New teachers, as judged by supervisors, were capable of presenting lessons very well, the overall mean of items being 3.73 as in Table (4). With regard to the new teachers' maintaining of students learning, the overall mean of 3.57 in Table (5) indicates that the degree of possession was rated as good.

This also applies to supervisors' ratings of feedback items in Table (6). The new teachers' ability with regard to learning facilitation was rated by supervisors as good with an overall mean of 3.72 as shown in Table (7).

TABLE (2)
Means and standard deviations of inspector's ratings
of the performance of new teachers graduating from S.Q.U.
on "time management items"
(5=excellent, 4=very good, 3=good, 2=pass, 1=poor)

NO.	Performance item	Mean	Stdev.	Rank
1	Materials and instruments are ready for use at the beginning of the lesson.	3.99	0.79	1
2	Encourages students to participate in the lesson	3.68	.89	2
3	Engages students at the beginning of the lesson	3.68	.85	2
4	Maintains students' interests throughout the lesson.	3.49	0.89	4
	Total	3.72	0.72	

TABLE (3)

Means and standard deviations of inspector's ratings of the performance of new teachers graduating from S.Q.U. on "Students behavior items"

NO.	Items	Mean	Stdev.	Rank
1	Establishes a set of rules and procedures that govern classroom administrative routines	3.16	0.78	5
2	Establishes a set of rules and procedures that govern verbal participation during various activities such as class participation, group work, etc.	3.37	0.90	4
3	Establishes a set of rules and procedures that govern movement in class during various activities.	3.52	0.82	3
4	Continuously observes the behavior of all students during various classroom activities	3.56	0.88	2
5	Stops any unsuitable behavior in a way that protects the student's dignity.	3.94	0.91	1
	Total	3.51	0.91	

TABLE (4)

Means and standard deviations of supervisors' ratings of the performance of new teachers graduating from S.Q.U. on "Lesson presentation items"

NO.	Lesson presentation items	Mean	Stedv.	Rank
1	Starts the lesson or activity with a revision of the previous subject.	4.22	0.81	1
2	Presents an introduction to the lesson or activity and specifies the objectives at an appropriate time.	3.87	0.83	4
3	Speaks with accuracy and fluency.	3.90	0.89	3
4	Presents the lesson or activity using language and concepts that students can understand.	4.00	0.83	2
5	Provides students with questions and illustrations that are related to the lesson in order to clarify concepts and skills.	3.65	0.86	7
6	Successfully specifies tasks that are to be handled by students.	3.41	0.86	11
7	Asks students questions of a suitable level.	3.82	0.86	5
8	Adjusts his teaching to a suitable level of students' speed of learning and presents illustrations when they are necessary for understanding.	3.46	0.85	10
9	Switches easily and efficiently between teaching and other activities.	3.60	0.89	8
10	Gives clear assignments.	3.53	0.89	9
11	Summarizes the main ideas of the lesson at the end of each class-period.	3.82	0.87	5
	TOTAL	3.73	0.68	

TABLE (5)

Means and standard deviations of supervisors ratings
of the performance of new teachers graduating from S.Q.U.
on "monitoring student learning items"

NO.	Monitoring student learning items	Mean	Stedv.	Rank
1	Maintains and applies reasonable and clear standards for accomplishment of work.	3.53	0.79	2
2	Observes students while working in order to offer relevant advice	3.53	0.93	2
3	Regularly uses oral and written learning outcomes in order to follow up student's progress.	3.49	0.83	4
4	Asks questions clearly and sequentially.	3.77	0.83	1
	TOTAL	3.57	0.69	

TABLE (6)

Means and standard deviations of instructor's ratings
of the performance of new teachers graduating from S.Q.U.
on "Feedback items"

NO.	Feed-back items	Mean	Stdev.	Rank
1	Provides students with feedback regarding accuracy of their performance in class.	3.49	0.86	2
2	Regularly provides the students with feedback regarding their performance in out -of- class assignments.	3.18	0.88	4
3	Reinforces the correct verbal response in an appropriate way and proceeds with the lesson or activity.	3.51	0.90	1
4	Provides continuous feedback when the response is not correct or there is no response by repeating the question, or clarifying it or providing clues or more time.	3.48	0.95	3
	TOTAL	3.41	0.76	

TABLE (7)

Means and standard deviations of instructor's ratings of the performance of new teachers graduating from S.Q.U. on "learning facilitation items"

NO.	Learning facilitation items	Mean	Stedv.	Rank
1	Has a teaching plan compatible with general and specific educational objectives.	3.97	0.85	2
2	Uses information from tests and other evaluation procedures to revise and develop educational objectives and tasks.	3.42	0.92	5
3	Maintains accurate records of student performance	4.05	0.94	1
4	Maintains an educational plan, which includes objectives, learning strategies, evaluation and student's needs.	3.64	0.89	3
5	Utilizes available human and material resources.	3.52	0.95	4
	TOTAL	3.72	0.73	

When the average ratings of the items in each of the six dimensions of performance are compared, it is found that minor differences exist between these six dimensions (i.e. the performance of new teachers, as perceived however, lesson presentation, time management, and learning facilitation) are the best rated dimensions. On the other hand, feedback, monitoring of student learning and student's behavior are the least- rated dimensions. The percentage rating ranged from 68% to 75%. This indicates that, on the whole, supervisors perceive new teachers performance as slightly above average in all dimensions. These dimensions in fact are significantly correlated with inter-correlation coefficients ranging from 0.64 to 0.85.

3. Comparison between ratings of principals and supervisors:

Since the items in the questionnaires of principals and supervisors differ, comparison between the two groups with regard to the evaluations of teachers involved their global ratings only. The means were 3.82 and 3.61 for principals and supervisors respectively. The difference between the two means was statistically significant ($t=3.93$, $df=181$, $p < 0.001$) in favor of principals. It would appear that supervisors are more demanding than principals in their evaluations. Also they look for specific elements of behavior that are the ingredients of good teaching, whereas principals appear to be more concerned with administrative and social aspects of evaluation.

4. Self - evaluations of new teachers:

New teachers graduating from S.Q.U. rated the forty-one competencies in their questionnaire on two dimensions: the importance of the competency and its degree of mastery. Average ratings of importance and degree of mastering for each competency are shown in Table (8). The discrepancy between the two dimensions was calculated for each item. Average discrepancies and their ranks appear in the same table.

TABLE (8)
Means and ratings of importance, mastery, and discrepancy between the two for each competency as perceived by new teachers graduating from S.Q.U.

NO.	Competencies	Mean of import	Mean of mastery	Mean of discrep.	Rank of discrep
1	Selection of content and method in the light of student-related factors.	4.40	3.22	-1.34	35
2	Utilization of teaching aids as a resource for teaching materials.	4.71	4.23	-0.47	4
3	Planning different types of lessons.	4.44	3.84	-0.69	9
4	Statement of instructional and behavioral objectives especially for a specific lesson.	4.62	4.35	-0.32	1
5	Organization of course contents in the light of objectives and time limit.	4.42	3.29	-1.18	26
6	Preparation of evaluation programs for teaching in the light of objectives and content.	4.38	3.34	-1.11	20
7	Preparation of suitable environment for the teaching- learning process.	3.31		-1.22	28
8	Planning external trips and activities.	3.32	1.99	-1.64	41
9	Motivating students to participate actively in learning.	4.53	3.57	-1.14	23
10	Utilization of group dynamics to help students to be more productive.	4.25	2.98	-1.42	37
11	Control of behavior through the implementation of psychological principles and rules.	4.07	3.21	-1.11	20
12	Application of principles of psychology, logic, and communication in teaching.	3.87	2.94	-1.04	18
13	Maintaining mechanisms for establishing communication between the student and the teacher.	4.09	3.12	-1.13	22
14	Selection of teaching materials.	4.14	2.97	-1.29	32
15	Production of teaching materials.	3.70	2.58	-1.26	30
16	Utilizing audio-visual aids	4.35	3.80	-062.	6

NO.	Competencies	Mean of import	Mean of mastery	Mean of discrep.	Rank of discrep
17	Using teaching methods that are relevant to the objectives.	4.69	4.15	-0.59	5
18	Motivating students to learn.	4.54	3.45	-1.24	29
19	Identification of students with problems and rendering help to them.	4.21	2.95	-1.52	40
20	Execution of field trips and other external activities.	3.47	2.27	-1.48	39
21	Evaluation of learning based on objectives.	4.32	3.63	-0.68	7
22	Analysis of evaluation results.	3.93	2.91	-1.15	24
23	Knowledge of historical development of education.	3.34	2.89	-0.42	3
24	Knowledge of objectives and principles of educational systems.	3.95	3.19	-0.68	7
25	Knowledge of differences between traditional and modern education.	4.33	3.42	-0.36	2
26	Knowledge of major teaching problems and their effect on education.	4.33	3.42	-1.00	17
27	Knowledge of the roles of teacher, student and community in education.	4.25	3.77	-0.69	9
28	Knowledge and understanding of the social context of learning.	3.67	3.03	-0.81	11
29	Understanding of psychological applications in education.	3.79	3.06	-0.90	13
30	Adaptation of teacher's methods to individual differences between students	4.22	3.30	-1.09	19
31	Knowledge of essentials of educational planning.	4.02	3.01	-1.19	27
32	Knowledge of teachers' duties	4.38	3.58	-0.91	14
33	Knowledge of laws related to education.	4.05	2.94	-1.33	34
34	Analysis of educational problems and investigation of their solutions.	3.83	2.78	-1.32	33
35	Planning and conduction of educational research.	3.68	3.01	-0.88	12
36	Evaluation of work as a teacher in relation to national goals of education.	4.02	2.97	-1.15	24
37	Development of traditional educational material and media.	4.36	3.14	-1.36	36
38	Follow-up of educational innovations	4.09	2.78	-1.47	38
39	Ability to deal with adolescents through understanding of their motives and behaviours	4.51	3.42	-1.28	31
40	Dissemination of important community development values among students.	4.42	3.63	-0.95	16
41	Displaying positive attitudes toward the profession of education	4.55	3.82	-0.93	15
	TOTAL	4.14	3.21	-1.16	-

The data in Table 8 show that most of the competencies (71%) were perceived as important (mean = 4 or more). All other competencies had means greater than 3 which indicates that no competency was perceived as being less than average in importance. On the other hand, means of mastery of the competencies reveal that only four competencies had high levels of mastery (mean 4 or more) while 32% of the competencies have means lower than 3 (i.e. mastery level was less than average).

When the discrepancy between mean of mastery and mean of importance was calculated for each competency, all discrepancies were negative indicating that mastery of each competency was less than desired. However, the absolute values of these discrepancies for 37% of the competencies were less than 1.00. Each of the remaining 63% of the competencies had absolute discrepancy greater than 1.00.

The most prominent competencies, which desire more attention, are:

- Selection of content and method in the light of student-related factors (-1.34)
- Utilization of group dynamics to help students be more productive
- Identification of students with problems and rendering help to them
- Motivating students to learn
- Execution of field trips and other external activities
- Planning external trips and activities
- Knowledge of laws related to education
- Analysis of educational problems and investigation of their solution
- Development of traditional educational materials and multimedia
- Knowledge of essentials of educational planning

It's observed from the table that ratings of all competencies exceeded 3, which indicates that new teachers perceived them as important. On the other hand, means of mastery of the competencies reveal that only four competencies attained high level of mastery (means 4 and above) while 32% of the competencies had means less than 3 which is less than average indicating that they were far from being mastered.

It's also noted from the table that all discrepancy values between mean of mastery and importance are negative, which indicates that mastery of each competency was less than desired. These results imply that further attention need be given to the mastery of teaching competencies in the teacher preparation program at S.Q.U.

Discussion:

The present study examined the problems new teachers graduating from the college of Education of Sultan Qaboos University face in their first teaching encounter, as perceived by the teachers themselves and by supervisors and principals.

The results indicate that while new teachers were deficient in some competencies, they demonstrated ability in others. Analysis of competencies in terms of importance and mastery has shown that although new teachers regard all competencies as important for their preparation, they believe that they have not mastered them to the desired level. This is indicated by the negative discrepancies in Table (8).

This finding is significant because it is indicative of inadequate preparation in these areas and necessitates that more emphasis should be placed on mastery of competencies in any future revision of the teacher preparation program at the college of Education.

This could be accomplished through intensive practice in the field. Competencies with the highest discrepancies, such as planning of activities, utilization of group dynamics in teaching, selection of content and method, and motivating students, should be given top priority in such training programs.

Another discrepancy that merits consideration is between the ratings of supervisors and principals. While supervisors appeared to be satisfied with the performance of new teachers in general, especially with regard to time management, class discipline, questioning skill, and reinforcement of students responses, principals tended to rate them low on items tapping teaching skills and development of study and thinking skills. One possible explanation for the discrepancy between the two is that principals are so preoccupied with managerial and social affairs that they hardly spare time for observing the behavior of teachers in the classroom. So their judgement is not as reliable as that of supervisors whose job is to monitor the performance of teachers in the classroom and to evaluate it objectively in terms of the criteria of good teaching. Principals can only judge on the basis of behaviors that they actually see.

In order to draw the maximum benefit out of the evaluations of principals, supervisors and teachers, they should be seen as complementing one another. This becomes a necessity if a comprehensive revision of the teachers training program is to be made.

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Development of the Colleges of Education for Teachers in the Sultanate of Oman

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Introduction

The teacher is the cornerstone of the educational process and one of the most important elements of developing educational systems, achieving their underlying objectives, implementing educational policies and contributing to the upgrading of the quality of educational services with a high level of efficiency and excellence. This highlights the basic strategy of improving teacher education as a tool to developing and modernizing the system of education.

The Sultanate of Oman lays emphasis on teacher education policies being solidly founded on scientific grounds in order to effectuate practical development in teacher education institutions, which comes in line with the global national policy of human resources development.

Within the context of teacher education, the Ministry of Education had, in 1976/77 opened teachers' training institutes which offered a 3-year teacher preparation programs for preparatory (grade 9) school-leavers.

In 1979/80 the one-year training system was included as an ad hoc program for secondary school-leavers. 1984/85 witnessed the development of the intermediate teacher training colleges delivering a 2-year program to secondary school-leavers. Nine intermediate colleges were opened and they offered training programs until 1994/95. These programs aimed at preparing primary school lower-class teachers (grades 1 to 4) and subject specialization teachers for upper classes (grades 5 to six) of the primary level.

The College of Education and Islamic Sciences of Sultan Qaboos University has been delivering teacher education programs at BA level for preparatory and secondary levels of schooling since 1986/87. In addition to that, the Institute of Education was established in 1991 to offer 1-year training for non-

educational Bachelor degree holders in order to teach at preparatory and secondary levels of education.

The current educational reform plan of the Sultanate of Oman has placed great emphasis on raising the quality of education. The Ministry's studies have concluded that there is a need for consistency across teacher education for the various levels of education including the primary level. Six of the intermediate training colleges were upgraded to 4-year university level colleges, "Teachers' Colleges of Education", four of which were for males in Nizwa, Sohar, Salalah and Sun and 2 for females in Rustaq and Ibri. This year 1997/98 the two male colleges in Sur and Salalah were converted into co-educational colleges at the request of the local communities of the two regions.

This paper focuses on the present Teachers' Colleges of Education and the basic principles underlying their programs.

The paper deals with the following topics:

Objectives of the Teachers' Colleges of Education
Program principles
Teacher Education Programs
The Practicum
Educational resources
Program implementation and follow-up
Future Plans

Objectives of the Teachers' Colleges of Education.

The Colleges endeavour to prepare distinctive generations of Omani teachers to teach in the various levels of basic and secondary education effectively through the realization of the following objectives:-

- Ensuring cohesion and consistency of a university level of teacher education for the various levels of basic and secondary schooling, with the aim of upgrading the quality of primary school teachers.
- Enhancing student-teacher's competencies in teaching at the various levels and their active participation in co-curricular activities as well as encouraging an effective role in the development of the local community.
- Expediting Omanization of teaching posts at the various levels of education, particularly at the secondary level.

- Promoting and upgrading the level of teaching scientific subjects (sciences, maths and tec.. ology) at the levels of general education in line with the Ministry's policy of improving the quality of education and copying with the scientific and technological progress of the time.
- Investing college material and human resources in the professional in-service upgrading of the educational sector staff: teachers, supervisors, administrators and educational leaders, through the organization of training courses and workshops.
- Planning and implementing community development services projects.
- Conducting and disseminating educational research to enrich the teaching/learning process.

Program Principles:

College programs are based on a number of basic principles. The following are the most important:-

1. The competencies approach. The following major competencies have been identified to agree with the envisaged role of the teacher.

- Subject specialization competencies
- Professional educational competencies.
- Cultural competencies
- Further development competencies.
- Community development competencies.

2. The credit-hour system and associated academic policies.
3. Programs of SQU College of Education and Islamic Sciences as the general framework for the Teachers' Colleges of Education with alterations to suit the context of the Teachers' Colleges.
4. A holistic approach to teacher education in which the academic, cultural and professional components have been integrated.
5. Emphasis on the practicum in keeping with contemporary international trends and practice.
6. Diversification of teacher education programs in order to prepare teachers for the two levels of education in various specializations so as to meet the actual requirements of the education in Oman.
7. Development of student-teachers' skills of interaction with the new technologies of education. This will be achieved through the computer courses offered to all students and the up-to-date facilities of the Learning Resources Centres established in the colleges.

8. Encouraging learning through the provision of varied references to avoid the sole dependence on text books, with the objective of enhancing students' self-learning skills and developing their ability to utilize multimedia resources.

9. Integrating academic and practical components of learning rather than dependence on the lecturing approach. This would entail increasing number of hours for workshops, school-based practical training and laboratory activities.

College Programs

The reform plan of the educational system is moving towards 10 years basic education divided into two cycles, the first of which consists of grade 1-4 and a second cycle made up of grades 5-10. This level of education is to be followed by two years of secondary education. The Colleges of Education offer several specialist programs designed to meet the requirements of the structure of school education. Student-teachers have the option to choose their area of specialization according to their abilities, interest and availability of places.

At present, the programs offered at the colleges aim to produce teachers for cycle 2 of the basic education level and the secondary level.

The twelve specializations are offered in follows:- Major/Minor, ten of which as combinations and two as majors only. See the following table:-

Islamic Sciences / **Major**	Arabic Language / **Major**
Geography / **Major** History / **Minor**	History / **Major** Geography / **Minor**
Physics / **Major** Chemistry / **Minor**	Chemistry / **Major** Physics / **Minor**
Physics / **Major** Mathematics / **Minor**	Physics / **Major** Computer / **Minor**
Chemistry / **Major** Biology / **Minor**	Biology / **Major** Chemistry / **Minor**
Mathematics / **Major** Physics / **Minor**	Mathematics / **Major** Computer / Minor

The Biology/Chemistry program has been postponed due to the sufficient number of Omani teachers in service who have graduated from the College of Education and Islamic Sciences at SQU.

Each of these programs has 132 credit hours which are translated into 190 contact hours to be delivered in 8 semesters, in addition to extra summer semesters for remedial or make up purposes.

The program addresses all aspects of training by the distribution of credit hours into 55% for subject specialization (a total of 73 credit hours) 25% professional and cultural courses (33 credit hours) and 20% Practicum (26 credit hours). See Fig (1)

Credit hours distribution ratio

Fig. (1)

Program Ratios

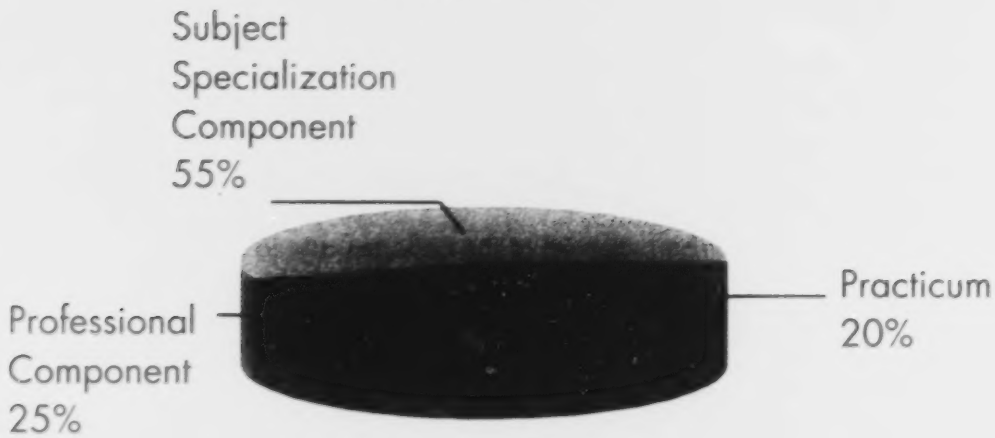


Table (1) shows student enrolment between 1994/95 and 1997/98

Table (1) Number of students enrolled between 1994/95 and 1997/98

Academic Year	Males	Females	Total
1994/95	335	244	579
1995/96	943	763	1706
1996/97	1237	868	2105
1997/98	1349	833	2182
Total	3864	2708	6572

BA in Education programs for cycle (1) teachers

These programs were not delivered from 1994 because of the high ratio of Omani teachers at the primary level, which in some regions had reached 100%. Priority was thus given to the preparation of preparatory and secondary school teachers. The educational reform plan has brought about the need for area specialization rather than class teachers.

A program for the preparation of cycle (1) teachers is now being developed and is expected to be completed by the end of the current academic year 1997/98 and to be introduced into the system from September 1998/99. This category of teachers will be prepared in the three degree areas of specializations:-

- Arabic Language, Islamic Education and social studies.
- Sciences and Mathematics
- English Language, with the option of offering other areas in the future.

3. Diploma of Education Program

This program aims at the professional training of non-educational B.A. and B.Sc. holders from Sultan Qaboos University and other universities who wish to join the profession of teaching.

It is intended that this program will provide another source of Omani teachers in cycle two of basic education and secondary schools within the country's policy of Omanization.

This program will be implemented this academic year in three colleges:- Rustaq, Nizwa and Sohar in the following areas of specializations:-

- Islamic Education
- Arabic Language
- Sciences
- Mathematics
- Social Studies

Other specializations like English Language will likely be added during the coming years according to the requirements of the Ministry of Education.

The duration of this program is one academic year (two semesters) delivering 30 credit hours distributed as follows:-

1. Foundations of Education	5 credit hrs.	16.7%
2. Psychology	7 credit hrs.	23.3%
3. Methodology	7 credit hrs.	23.3%
4. Practicum	9 credit hrs.	30%
5. Elective courses	2 credit hrs.	6.7%

It was considered important that consistency of programs objectives, program competencies and other schemes to be maintained for the proper implementation within the context of overall college system.

The Practicum

The Practicum is one of the basic program components since good preparation of teachers requires integration of academic, cultural and professional inputs in addition to the basic competencies required for future performance.

Following are the most important principles of practicum:-

- Increasing the number of practicum hours and starting it at an early stage.
- Emphasizing school-based training which ensures a minimum number of hours for students to practise teaching in a school as part of the practicum program.
- Developing college-based practicum with the aim of acquainting students with concepts of the basic competencies of education necessary for their future tasks. This is to be implemented through the organization of workshops and other college-based activities.

Practicum of the BA in Education component

A total of 26 credit hours, making up 20% of the total credit hours of the program have been assigned to the practicum which starts early in Semester 3 and continues till September.

Table (2): Distribution of the practicum 26 credit hours

Code	Course	Block practicum	Serial practicum	College-based practicum	Total
1501	Practicum 1	–	2	1	3
1502	Practicum 2	1	2	1	4
2501	Practicum 3	1	2	1	4

2502	Practicum 4	2	2	1	5
3501	Practicum 5	2	2	1	5
3502	Practicum 6	3	1	1	5
Total		9	11	6	26

- The practicum comprises three basic activities:-

a. Serial practice at schools and college-based micro teaching (40% of practicum hours).

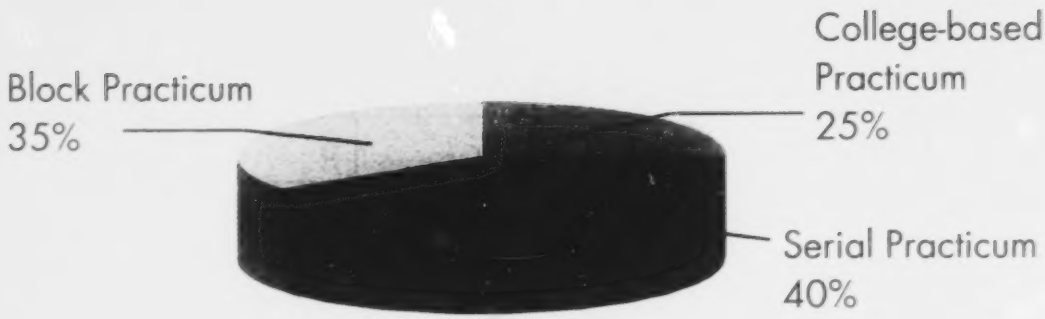
b. Block practice (35% of practicum hours).

- College-based practicum (25% of practicum hours).
- The serial practicum has two integrated components which are training on the basic teaching competencies through micro teaching sessions and school-based training where these teaching competencies are applies.
- The block practicum is organized to offer teaching opportunities in one week in each of semesters 4 and 5, two weeks in each of semesters 6 and 7 and 3 weeks in semester 8.
- The college-based practicum component aims at assisting student-teachers acquire these seven basic competencies during semester three to eight.

1. Lesson Planning
2. Awareness with the School Curriculum
3. Teaching Strategies and activities.
4. Teaching aids and Technology
5. Language skills
6. Assessment.
7. Management of the learning process

Seven modules have been developed for each competency focusing on the objectives, content, activities learning resources and assessment methods.

Distribution of Practicum Ratios



Practicum component of the Diploma of Education Program

- 9 credit hours (30% of the total program hours) have been allocated for the practicum, distributed over practicum components as follows:-

1. Four credit hours, 45 for serial practice.
2. Three credit hours, 33 for block practice.
3. Two credit hours, 22 for college-based workshops.

- This occurs over the two semesters with four credit hours in semester One and five in semester Two.

Distribution of Practicum Ratios

Table (4): Distribution of the practicum hours:-

Component Semester	Serial Practicum	Block Practicum	College-based	Total
5001 1st	2	1	1	4
5002 2nd	2	2	1	5
Total	4	3	2	9

Learning resources

The colleges provide a range of resources for teacher education. Learning Resources Centres have been established in all colleges offering updated multi-media resources for faculty and students.

For each of the courses offered there are at least three reference books available for students to borrow, and at least five references for each faculty member in addition to video, tape CD ROMs and software collections.

A number of program outlines and course description booklets were also produced which are subject to constant review and development.

Program implementation

A central Program Committee has been established with the aim of monitoring implementation of the academic components and facilitating the clear understanding of program objectives by teaching staff.

A mechanism for program improvement by teaching staff has been developed by forming intra-college academic department councils and inter-college specialized committees, in addition to workshops and site visits organized by Ministry experts.

Following graduation of the first batch of student-teachers a summative evaluation will be conducted according to a plan set up for this end.

Future development plans for the Teachers' College of Education

- The Teachers' Colleges of Education will face several challenges in their attempts to keep pace and respond positively to the requirements of the comprehensive development plans of the country. It is envisaged that future planning and action will be required for design of further basic education teacher education programs according to the general educational reform policy in Oman.

- Professional upgrading of the graduates of the 2-year Intermediate Teacher Training Colleges to B.A. degree Level.
- Development and delivery of various specialized in-service courses for teachers and other educationists in order to meet particular reform plan needs requirements.
- Promotion of educational research and studies and the undertaking of cultural and other activities such as seminars and workshops designed to enhance community development.

Challenges:

In summary, teacher education policies in the Sultanate of Oman aim to develop teachers' abilities to competently and efficiently carry out their roles and competence within the requirement of the education reform plan. The colleges will expedite the omanization of teaching staff posts with an annual intake of 2000 students in addition to the numbers of teachers in the Diploma of Education Program.

Upon implementation of the College programs the following challenges have been experienced:

- Implementation of the Practicum posed the problem of inadequacy of numbers of training schools, which in many regions was not sufficient for school-based training.
- Type of mentors to assist in school-based training. College supervisors cannot see all student-teachers at schools.
- English language is now seen as essential for students to gain access to resources and the Internet.
- Changing attitudes of faculty and students towards the program structuring so that it gains more flexibility in terms of content, structural methods and aids and evaluation.
- Technology and information systems related courses need to be updated, e.g. educational media course.
- Changing attitudes towards methods of teaching/learning, e.g. lecturing v.v. interactive learning, experiential learning, etc.

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The Internet for Omani Teachers

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Basic education school teachers who will be responsible for implementing the educational reform in their schools must have skills, practices, and training on the use of information and communication technology. The use of communication technology will promote a good connection with each other, with the trainers at the training center, and possibly with other teachers across the nation and the world.

It is essential to establish this kind of interconnectedness for the following reasons:

1. Being in touch with each others, teachers can share experience which will lead to improvements in their teaching performance;
2. Having access to be connected to the training center where they receive training, the teachers can seek assistance in their teaching and receive feedback on their performance. This in turn enhances their professional development.
3. Getting access to the Internet, they can expand their sources of information; these sources can be for their professional or general knowledge.

It is suggested that the appropriate and convenient medium of communication for those teachers is the Internet. The proposed features (or services) of the Internet which are assumed to promote teachers' interconnectedness are:

1. E-mail
2. Newsgroup
3. File Transfer Protocol (FTP)
4. Gopher
5. Telnet
6. World Wide Web

This paper describes a curriculum for using the Internet and the above-mentioned features of it. This curriculum is to be taught to trainers who are going to be responsible for training Omani teachers, and later on it might be taught to Omani teachers in basic education schools.

It is expected that after acquiring this information about the Internet and its features and gaining some practice, Omani teacher trainers can use these features confidently and design home pages creatively. This in turn will would promote and enhance interconnectedness among teachers.

The Internet for Omani Teachers

Introduction:

Nowadays, communication technologies make the world a small village; what can take place in one end of the world can reach the other end quickly and easy through these technologies. Information from all its sources spreads fast. In addition people from different parts of the world find it easy and accessible to get to know about each other through the means of communication they select to use. In this sense, this is a promotion of interconnectedness among people.

It can be said that communication technologies foster constructive interconnectedness among people of different backgrounds and professions; they can share, exchange, and discuss matters and ideas of common concern comprehensively through these technologies.

One useful and popular medium of communication these days is the Internet; it is another tool that promotes linkage among people. The Internet plays a significant role in our lives; it provides us with many services that we appreciate very much. In other words, it is our window to the world; we can access it to get instantaneous information and communication; it provides free commercial resources. Laquey and Ryer (1994) put the advantages of the Internet and what it can provide in the following:

> In short, the Internet gives you access to more people and more information faster than you can imagine, including online catalog from most major U.S. academic and research libraries and from more and more foreign libraries (p10)

This paper redefines a curriculum of technology for in-service and possibly for pre-service Omani teachers. This curriculum acquaints Omani teachers with use of the Internet in developing their careers. It includes a definition of the Internet, some of its relevant features that can enhance linkages with others, and its role in connecting Omani teachers nationally and internationally.

Part I

The Internet

Definition:

By definition the Internet is a loose amalgam of thousands of computers connected together by networks literally spanning the globe; it embodies millions of uses all over the world.

One advantage of the Internet is its ability to promote interconnectedness among people. Those who own computers connected to Internet services find it easy to communicate to others at any time. It is not only easy, but also cheap, reliable, and fast global communication. It is a forum where intensive interaction and free communication can be found among people. It is also a place for entertainment, for advertising, and for practicing business.

History

The idea of using the Internet as a tool of sending and receiving messages originated in 1969 when the United States Department of Defence set up a network of computers to send and receive secret military messages. Then later, in the mid 1980s the idea of using the Internet worldwide started to develop and large networks linked to supercomputers were originated.

The Internet has many different kinds of service which can be easily accessed and used. Some kinds of service are used to get different types of information and others are used to get in touch with people. Each kind of service has its own characteristics that distinguish it from the others.

This paper looks at some of these kinds of service and discusses them in detail elaborating on the characteristics and the importance of each kind.

1. Electronic Mail – (also known as e-mail)

Electronic Mail is the most popular application of the Internet and widely used by many people. Unlike ordinary mail, electronic mail is a lot faster, cheaper, and more convenient. From home or any place where there is a connection to the Internet, messages can be sent and received in seconds. There is no need for going to the post office to get mail or lining up to post a letter. Because it is cheap and fast, e-mail application allows individuals to send many messages to different parts of the world. There is also the security of the mail's delivery to recipient's address; messages will not be lost, in most cases. This adds another advantage to using e-mail service. Another distinguished

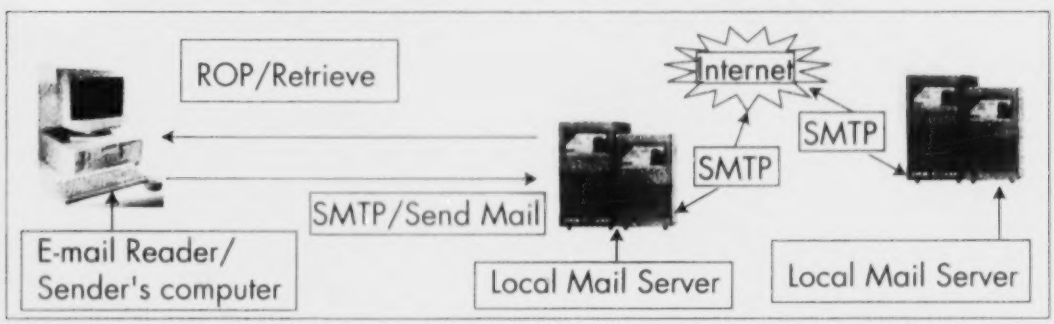
feature of the e-mail is the possibility of sending coupon copies of an e-mail to more than one individual. Messages can be typed in any word processor which means messages can be easily edited and checked before they are sent. They also can be read by any word processor or by mail program itself.

There are three common protocols of sending and receiving e-mail messages: Simple Message Transfer Protocol (SMT), Post Office Protocol (POP) and Internet Message Access Protocol (IMAP).

The Simple Message Transfer Protocol is a rule designed to transfer messages from the sender's (the user) computer to the Internet mail server. Post Office Protocol (POP) and Internet Message Access Protocol (IMAP) are methods where messages are stored in the Internet for retrieval. When the recipient connects to the server the messages are downloaded from (POP) or (IMAP) to his or her machine.

The process of sending an e-mail message could hardly be simpler. The following steps show the procedures of sending a message:

1. The person, who wants to send a message, types the message in any word processor or a mail client program that is used to send and retrieve e-mail messages. She/he can also attach a file or files to the message. The file/s can be any formats (doc, text, graphic... etc.) and of any sizes.
2. The mail program/server sends the message to the outgoing mail (SMTP) of the sender's Internet.
3. The outgoing mail server connects to incoming mail (POP3) of the recipient's Internet and sends a copy of the message.
4. When the recipient's mail program connects to the mail server, it checks for new messages and if there are new ones, it downloads to the client.
   (The following figures shows the mail process)



2. Newsgroup

Newsgroup, also called Usenet, is a tool designed or created by a group of people who share similar interests and common thoughts. It is a forum to exchange messages with the other users of the Internet. There are thousands of newsgroups available through the Internet and they are classified topically. Some of these newsgroups are concerned with the following topics: 1) recreational activities and hobbies, 2) news network and software, 3) science, 4) computers and 5) various other topics. That is, each newsgroup is devoted to a particular subject area of interest. The most common newsgroups are recreational newsgroups (alt.(dot)something) and newsgroups of various topic (rec.(dot)something). Participants can post their ideas, questions, replies and maybe news. These messages (also called postings) can be read and answered by other Internet users, who in most cases are members of that particular newsgroup. Newsgroups are frequently updated with new postings and old postings are deleted from newsgroups after a period of time.

The protocol of distributing news through the Internet is called Network News Transfer Protocol (NNTP). To enable the Internet user to read and post his or her postings, she/he needs to have a newsreader program (a news software). Most newsreader software (or programs) that is available nowadays can perform several operations. For example, they can download and display newsgroup articles; they can also allow the user to read and respond to particular articles.

To avoid embarrassment, it is important to note that one should be careful and should think before posting any messages onto newsgroups because as soon as a message is posted, it is available for everybody to read.

3. FTP

FTP stands for file transfer protocol. FTP allows you transfer (download) files from remote computers onto your computer. These files could be program files (with. exec extension) or document files that are scattered all over the Internet. It also allows you to upload files from your computer to a remote one. Although there are many ways to transfer files onto user's computer, FTP is the fastest and the most efficient method. After the transferring is completed, the target file/s stored on the hard drive can be run or read later on. In some instances, however, the transferring might not be successfully completed so you need to FTP the file/s again.

To enable the user, who wants, to FTP a file, she/he must have valid password and user name known to the host computer that the target file located because file transfer protocol is authenticated protocol. There are some files for the public that can be transferred by anyone without a password and a user name using anonymous or guest, however. These called anonymous logins.

4. Gopher

Gopher is another tool which enables the Internet users to browse the Internet and retrieve information from it. Unlike the World Wide Web, gopher is not graphic environment; it's a dull page. Created at the University of Minnesota, it was used as a tool to search for information.

Gopher presents information lists rather than hyperlink documents. It contains menus, sub-menus, and sometimes sub-sub-menus. A menu leads to sub-menu which in turn leads to sub-sub-menu. A menu does not brief about the item; it takes the user to the site/s where that item is available. Much information available on the Internet can be accessed and downloaded through Gopher.

4. Telnet

Telnet is the name of protocol used for remote login. Telnet is a fast login for connecting to another computer using a modem. Through telnet, users can search for any particular information and download the files of that information onto their local computers. The advantage of the telnet is that it gets fast access to information and downloads quickly. Access to libraries and data files is a most valuable telnet service that users can get.

5. World Wide Web

WWW becomes the second widely used tool of the Internet after E-mail. WWW (w^3) is another Internet tool to access the wide information resources available on the Internet. WWW emerged as a solution for some of the difficulties in using other interfaces such as telnet, FTP, and Archie. The difficulties in using these interfaces lies in learning some commands that are difficult and dull to memorize for novice users. There is also a limitation of information resource in these interfaces. WWW is easy to use and fast to find different type of information resource. WWW is a hypertext and graphic display; it contains text, images (pictures), video and audio clips, graphics, tables, and even forms to fill in and submit. Some WWW pages contain hot links, the clicking on which takes a user to a different page within the same site or to a different site. Hot links, then, ease the process of searching for information.

For a user who wants to visit a particular Web site, she/he has to know the address of that Web. Web addresses are called URLs which stands for Uniform Resource Locations. It is a good idea to understand the URLs. Most URLs have the following features in sequence: (WWW).(the name of site).(the type).(the country)/(the slash means file or html files). The following example gives further illustration to understand URL: www.gto.net.om. The abbreviation **gto** (General Telecommunication Organization) stands for the name of the site; **net** means the type of site; **om** means Oman, the name of the country. There are different types of sites. For example, com stands for commercial, org stands for organization, gov which means government and some sites have the country's names.

Part II

How can the Internet serve the Omani teachers?

The previously defined features or tools of the Internet are very important for Omani teachers with which to acquaint themselves. These tools are more than enough to achieve many of their professional aims in using the Internet. Through these tools, Omani teachers will be connected to other teachers nationally and internationally. That is, they can send e-mails to their colleagues in the Sultanate as well as receive them. They also can form relationships with other teachers from the Arab world as well as with other teachers from all over world, if they have a good command of English. In these e-mails they can have the advantage of sharing their experience with other teachers and the advantage of exchanging ideas, thoughts and possibly counsel. They will also be updated with new professional findings in different subject areas.

Using WWW tool, Omani teachers can access different types of information; they can search for a particular piece of information of their interest or specialty through the available search engines such as Yahoo, Infoseek and Excite. This information would play a major role in developing teachers professionally.

Being conversant with the use of Gopher and FTP, Omani teachers can explore different types of information resources; they can download files on different subjects and program files from different location onto their computers. Not only can they download files from different sites, but they also can upload files to remote computer, when they upload files for their homepages, for example.

What is most important of all is to be adept using the newsgroup service. The newsgroup/s that they read or subscribe to will be a rich, miscellaneous and constructive source of information. In addition, it will be possible for them to create their own newsgroup on which they can post their own contextual messages.

Homepage

To achieve, in this case, some of the ultimate goals in using the Internet, it is essential that Omani teachers lay their hands on some source for methods of designing homepages. Three common sources of assistance are available (to my knowledge) for creating simple to complicated homepages. The sources are listed and explained as follows:

1) Using shareware or freeware programs:

There are many Web page authoring programs available for download for free or at minimal price. Some of them can be sampled before buying them; they expire after a period of time. The shareware programs contain some features of the full version of the commercial programs. HotDog 16 and Netscape are examples of these shareware or trial programs. Usually they are easy to use and they contain samples of homepages.

2) Authoring through commercial software programs.

These types of Web page authoring programs are full version; they contain a compete bundle for creating homepages.

3) Using a word processor.

Another tool of designing a homepage is using any word processor such as word and notepad. This method requires acquaintance with some skills in HyperText Markup Language (HTML) programming. Authoring a homepage with HTML is not that difficult. Learning few commands (codes) would help to design a homepage. The file HTML contains a series of commands (In Appendix A, there are some examples of these codes/commands).

A homepage can be a good medium to connect people who share common professions, interests, and hopes. They contain information which can be accessed at anytime of day and made available for everyone to read or download. The information found on the homepage varies vastly; it can be academic, artistic and political. Homepages depict differences of personalities. Homepages are also places where individuals can express their identities, cultures, creativity, and backgrounds. Designing (or authoring) and maintaining a homepage can be good methods for learning different skills. For those who have a poor command of English, especially in writing and reading, they can improve their English because authoring requires writing and reading in English. This in turn will highly motivate them to learn more about the language. Also designing a homepage will improve computer literacy; they will learn and practice the basic skills of operating the computer and writing their pages. In addition, having the feeling that their homepage is to be visited by others might encourage them to produce a good piece of work.

Part III

Model of a Homepage

To clarify the concept of a homepage and to show a model of a homepage, the author of this paper has signed a homepage for Oman teachers and called it "The Omni Teachers' Homepage". This page is available on the Internet at the following address: www.geocities.com/collegepark/library/1657. It contains the following features:

1. Hot links to ten educational regions. One of these links is active to illustrate how the homepages of each region is going to look. Dhofar region's homepage contains the following components: 1) links to different sites: there are links to new sites regional, national, and international in Arabic and English. These links provide daily news about the country and about the world.

2. There are also links to different search engines in Arabic and English, so from this page one can search for the information she/he needs. 3) There are also three buttons to link to pages where professional topics and matters such as case study, classroom control, and sharing experience are posted.

3) There is also a link to an e-mail address (mailto) for visitors to send e-mails to the page editors. The messages are delivered to the editors through the specified address for them.

Maintaining and updating the Omani teachers' Homepage

It is essential that the Omani teachers' homepage should be maintained and updated regularly. Some of its components need to be updated on a weekly basis; other components can be updated from time to time accordingly.

This would require somebody to do these tasks. It is recommended that the person who will be in charge of maintaining and the updating has the following abilities: 1) they should be aware of some Hyper Text Markup Language (HTML), the language of creating homepages; 2) they should be knowledgeable in the subject area of the reform curricula; 3) they should have a good command of English.

Therefore the best choice for handling these tasks are the Omani inspectors. In each region, the proposed team of inspectors consists of three inspectors: Islamic and Arabic inspector, Math and Science inspector and English inspector. The English inspector will play a major role in this group. She/he will translate

articles from English to Arabic and vice versa. She/he will be responsible for responding to non-Arabic speakers through e-mails as well as responsible for English subject issues. The other inspectors will be responsible for their subject areas; they will reply to inquiries about their subjects.

Each team will meat three times a week, or when necessary, to edit and post new messages as well as to read the incoming messages through e-mail and newsgroups. Other responsibilities for this team include circulating any relevant, appropriate and professional articles and messages that they receive through the Internet. They will also receive teachers' contributions and post what is appropriate.

Conclusion:

It seems that the Internet is a vital resource of information and a very good medium for communication among people. As a resource of information, there are so many different types of information available through it. These types of information can be general or specific. As a medium of communication, it has many features through which communication among people is promoted. There is the e-mail service. There is also the newsgroup service. There is also the real time conferencing service through which people can chat and even see each other. The homepage is also a good tool for sharing ideas and interests with other people.

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Appendix A

Some good sites to visit

Site Address (URL)	Language
Search Engine	
http://www.alidrisi.com	
http://www.ayna.com	Arabic
http://www.yahoo.com	English
http:/www.infoseek.com	English
Literature	
http://www.toptown.com/centralpark/said/als.htm	Arabic
http://www.awo.net/tra-ent/culture/intro.htm	English
Kids only	
http://www.homeinteractice.com	Arabic
http://www.lotfy.com.eg	English
Newspapers	
http://www.watanom.com	Arabic
http://www.countrylink.com/arabnet	Arabic
http://www.almajilis.com-news-news.html.url	A collection of newspapers' sites both in Arabic and English
Magazines	
http://.../september/	Arabic
http://www.assabeel.com	Arabic
http://www.arabia.com/byte	English
http://www.gpg.com/cnme/	English

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Appendix B

How to Create A Homepage Using any ASCII Editor

To create a Homepage using any ASCII editor, such as Note pad, you to insert tags in your document. Formatting tags appear between <and> signs; they usually appear in pairs. These tags tell Internet browsers such as Explorer and netscape how to display texts, pictures and other features on the screen HTML document starts with <html> sign and end with </html> sign. In between these two things occurs the basic layout of HTML document. The following table contains some basic, essential tags.

Tags	Function
<head? ... </head>	
<hl> ... </hl> (header)	The largest size for a header The large size for a header Note: The bigger the number, the smaller the size
...	boldface text
 	line break (to break the text line)
<p>	to insert an extra line space between paragraphs
<l> ... <l>	to use italic text
<align=right> ... </right>	to bring the text to the right
<align=left> ... </left>	to bring the text to the left
<align=center> ...	to cente the text
<img scr="image.gif">	to insert an image with GIF extension (images with different extensions can be insert as well such PCX, BMP and TIFF)
...	to establish a hotlink to another in the same folder
...	to establish a hotlink to another site
<hr>	to make a line running left to right across the page; it can be used to separate one session from the next

The basic skeleton for an HTML document appears like this:

<html>
<head>
<title> The title of the page </title>
</head>
<body>
Text of the page
</body>
</html>

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Topic # 1:
The Need to Redefine Teacher Education in Oman

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The Need to Redefine Teacher Education in the Sultanate of Oman

Expected changes in the economic resources and particularly the income sources in the next century have triggered new educational reform in the Sultanate of Oman. These changes are based on education theories and teaching approaches that aim to produce self dependent graduates who can survive in a technologically linked world. This reform necessitates the inservicing of teachers and the redefinition of pre-service and in-service teacher education. In this paper I will try to shed light on the effects of the new education reform on the in-service teacher training and how it promotes interconnectedness with the outside world. My focus will be on the training needs for the Curriculum Subject Departments due to the new changes in the curricula. The introduction of technology in the Basic Education Schools' curriculum adds another responsibility to the Department of Training and Professional Development. The paper will consist of three main parts:

First, I will look at the above curriculum changes. Changes in the curriculum will not bring about reform unless accompanied by training. Hence, the training needs will be discussed in some detail.

Second, a survey of computer awareness and Internet uses will be discussed in relation to the new reform in education and the training needs.

Third, a brief account about what has been planned by the Department of Training and Professional Development to meet the training needs will be given. Analysis of the plan will reveal focus areas. Then, the paper will be concluded by a synthesis and suggestion to the Department of Training and Professional Development.

The Need to Redefine Teacher Education in the Sultanate of Oman.

1. Introduction:

In many countries, educationalists adopted nearly similar definitions for in-service training. These definitions describe in-service training as "all activities that teachers carry out which contribute to their professional development and efficiency". Ibrahim Abdullah (1987:8) Both planned and unplanned activities which may lead to one's professional development can be called in-service training. However, education systems cannot rely upon unplanned skills and knowledge acquisition and take it for granted that professional development will occur. Work experience is essential, yet, it is unlikely that all people will benefit from it equally. In addition, systematic training is needed to keep oneself well informed about innovations in the educational field. No doubt most educational activities may contribute to one's professional development but planned training is inevitable to cope with change and to make sure that most people in the education field receive some sort of training. The amount and quality of training is usually determined by the need and the resources available. Thus, one can distinguish between in-service training and work experience. The former means systematic and planned training to accomplish certain goals or develop new skills. The latter refers to any unplanned activity or experience that may lead to one's professional development or the solution of a work related problem.

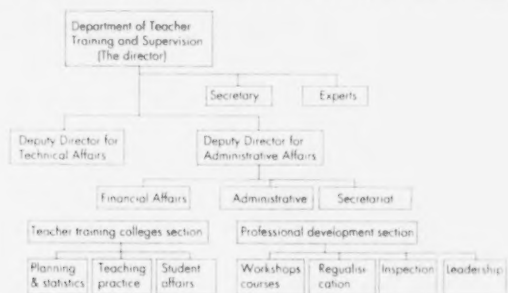
1.1 Pre-Service and In-Service Training in Oman:

At the beginning of the renaissance in the Sultanate of Oman in 1970, it was impractical to wait for well qualified Omani school staff to come forward. The urgent need of the Ministry of Education determined the recruitment of some Omani teachers with simple knowledge about teaching. However, the Ministry has taken immediate and measurable remedial steps to fully qualify these Omani teachers by giving them short intensive professional development skills courses. Therefore, in-service training in Oman started as early as 1972. Salha (1995:160)

Over the last 27 years teacher education in Oman has experienced many changes and developments. Pre-service training has started by accepting students after nine years of schooling to be trained in Teacher Training Institutes (TTI) for three years to gain a diploma in education. In the 80s, the system was

changed into Teacher Training Colleges (TTC) which used to train students for two years after 12 years of general education. Recently, the four year Teacher Training Colleges have been introduced providing a four year program leading to a B.Ed. A point worth mentioning here is that teachers who were trained in the TTIs and TTCs were not considered as mere stop-gaps that were rushed into the schools to make up for the shortages in staff for a number of reasons: first, they received sufficient training for the school needs at that time; second, they have received full recognition as teachers; third, these teachers have proved to be competent. In addition, they received some in-service training that enhanced their teaching skills and knowledge. Therefore, they must be treated as teachers that can be promoted to higher levels through subsequent training courses. They can take their places as equal to the four year college graduates or to university graduates. This pattern is similar to the one described by Williams (1991:3). In U.K they opened 55 specially created Emergency Training Colleges in 1950 to retrain student teachers who were rushed into schools to tide over the immediate crisis after the world war 2.

Throughout the developments in Oman's educational system, the Ministry of Education did not lose sight of the need to prepare effective teachers who can carry out its message and achieve its goals of creating self dependent graduates. Both pre-service and in-service programs were implemented simultaneously . According to the study by Ibrahim Abdullah (1987) there were three main components in in-service training, namely: basic qualification; continuous training; and courses and seminar's section. The first section was designed to carry out training courses for teachers who did not go through formal teacher education programs. The second section was designed to update teachers' knowledge about the new methodology in education. The third section was meant to provide specialized courses in leadership for proposed school headmasters / headmistresses and inspectors. The following diagram shows the structure of the Department of Teacher Training and Supervision which was the responsible body for pre-service and in-service teacher training. Salha. Ministry of Education (1995:162)



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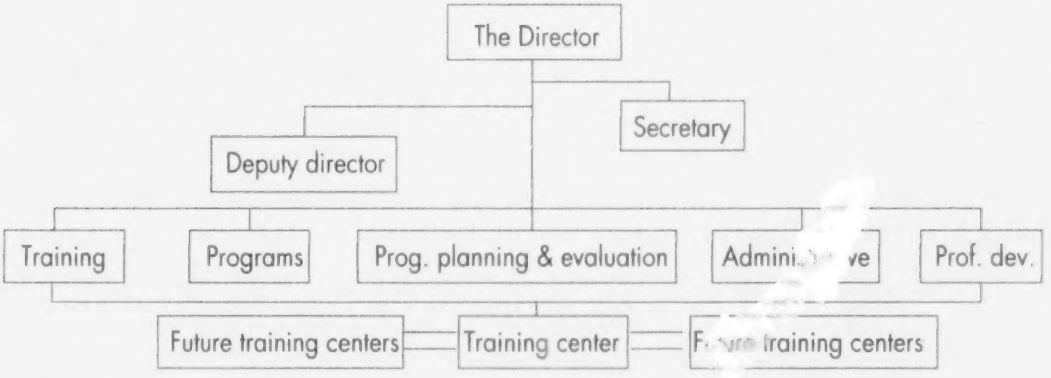
The history of in-service training in Oman can be divided into three main phases. Phase one was in the 70s and early 80s which was described in the study by Ibrahim Abdullah. Phase two was from mid 80s until mid 90s as shown in the above diagram. During that period the focus was on pre-service training. Phase three has been necessitated by the current educational reform in Oman. The creation of the Department of Training and Professional Development justifies the focus of the Ministry of Education on in-service training and the importance of training for the success of the educational reform. The structure of this department, which is replacing the above Teacher Training and Supervision Department, reflects the new thinking and corresponds to current needs.



(The Current Structure of the Department of Training and Professional Development)

The phases of the in-service training match the developmental stages of education in Oman. This dynamic situation of in-service training has lead to the achievement of a number of goals and continuous professional development of the staff. However, the new educational reform requires redefinition of teacher education to include the requalification and orientation of teachers for change and reform in the educational system. This last point will be my main issue in this paper. Specifically, I will be looking at the implications and impact of the new reform on in-service teacher training in Oman.

1.2 The quality of in-service training:

Before embarking on describing the aspects that should be infused in the current training workshops and courses to make them more effective, it is necessary to give a short account about the philosophy underlying the new educational reform in the Sultanate of Oman. According to the Educational Consulting Services (ECS, 1995) new educational goals should be set to meet

the challenges facing Oman, especially the need for self sufficiency; economy diversification and keeping pace with technological change. The reform should prepare the Omanis for life and work in new conditions created by the global economy. Hence, they should be well equipped with the necessary knowledge, mental skills and attitudes that will help them survive in the different future. Therefore, the ECS report identified the need to strengthen the teaching of three subjects, namely: Science, Mathematics and English. Thus, in-service training should promote change in aims and objectives, content, teaching and learning strategies and modes of assessment in all subjects.

I believe this cannot be achieved without the establishment of more training centers that gather evidence of good practice and training needs and devise the necessary courses. In fact, the Ministry intends to open more training centers in the different regions of the country. (see diagram above). In addition, in-service training has to go through those stages that were mentioned by Williams (1991:52), namely: progression; relevance; differentiation; balance; breadth and depth. These criteria will be used as a check instrument to judge in-service training in Oman.

a. Progression: According to Williams, the significance of the disconnected ad hoc training events should be downgraded while progressively planned training events should be upgraded. Educational planners have to keep track of staff professional development in order to consolidate and develop introductory training experiences, implement training for promotion to new posts and upgrade professional knowledge.

Williams states that "the arguments that the achievements of pupils ought to be monitored and recorded for both diagnostic and summative assessment purposes apply just as much to the professional growth of teachers" Williams (1985: 52).

If we apply this to the previous practices in Oman in the 70s, 80s and early 90s we find that, according to the study by Ibrahim Abdullah (1987) and interviews with people who worked in the Department of Teacher Preparation and Supervision, there were three main sections: teacher training colleges; professional development and in-service training. Most activities were dominated by the Teacher Training Colleges which were concerned about the pre-service training. The Professional development section was limited to the provision of administrative and supervision courses while the in-service training section was given less attention. It had implemented a number of disconnected courses on teaching skills. Curriculum departments implemented a number of

courses but they were also disconnected and not linked. However, it should be mentioned that the focus of the training on pre-service was more important at that time to meet the country's urgent need and not to rely totally on expatriates. As already mentioned the Ministry has up-graded the TTI graduates to the equivalent of TTC graduates and soon will be commencing on a huge project to requalify these up graded teachers into a four year degree.

b. Relevance: It is axiomatic that any training workshop should be relevant. Yet, this concept is not straightforward. Sometimes, there are contradictions between the need of the school or department and the personal needs and priorities of the trainee. There are contradictions between different roles that the teachers are expected to play. Thus, the training needs should be prioritized. In Oman the concept of relevance is usually determined by the employer. Training programs are implemented when they are perceived by the concerned body in the Ministry to be important. Although criteria are set for who should attend what program, the actual selection is left for the department where the employee works. The selection process can be influenced by a number of reasons, such as the administrator idea about the candidate's willingness, energy, reputation, and ability all of which can be impressionistic.

c. Differentiation: Williams (1991:53) refers the importance of differentiation to the personal characteristics of the teachers. He mentions that it is difficult to pitch the level of the activity because of the heterogeneity of the attendants.

He says, "yet so variable are teachers that it is extremely difficult to pitch training activities at the appropriate level to take account of individual differences" (1991:53) I feel that differentiation should not be taken as an excuse not to gather a pool of teachers of different interests and needs to attend similar training programs. Needs assessment should consider the departmental needs and the personal needs while course planners should try hard to gather candidates of similar interests. In Oman, it seems that the personal characteristics of the employee is the most influential factor in the selection process. Administrators tend to select people who they think are enthusiastic, motivated, and have the energy and time to attend. This is acceptable for the Department but it could be discouraging for the rest of the staff. Furthermore, the same people can be selected for repetitive courses which will result in their becoming bored and aimless. It can also be argued that such trend may create a diversity of standards of knowledge and skills in one workplace which may lead to the domination of the trained group over the rest of the staff.

d. Balance: Williams (1991) argues that balance is used as a reminder that attention must be paid by both the teacher and the in-service planner to the tension created in professional development of teachers. Teachers must be able to see ahead the opportunities that they may gain from in-service training. I think that balance may bring about equality and equity to all teachers. In Oman, one finds that big projects of requalifying teachers are characterized by equity and equality while the disconnected training events lack systematic selection of trainees. One can argue that in Oman in-service planners need to set a structured system for training opportunities for all teachers. However, the application of such a system will depend on the availability of resources and time for training.

e. Depth and Breadth: These two concepts help the planner to determine the aims, objectives, content and teaching strategies of the training programs. Some trainees will need shallow and superficial knowledge while others may require wider and deeper understanding according to the need and role that the trainees are expected to take.

From the above discussion it is clear that the Department of Training and Professional Development in Oman needs to construct a structured system for training opportunities to all teachers. In addition, progressive training must be the Department's long term goal. Ad hoc training events are good for the short term purposes that they are set for but the long term goal should be progressive training that leads to similar professional development for most teachers .

National training projects such as the upgrading of teachers include the aspects of progression, balance, relevance, depth and breadth. Yet, the actual professional growth of the teachers has not been assessed. It has been presumed that such comprehensive projects will bring up the teachers' professional knowledge and skills. Hence, such projects are progressive in terms of level and sequence relevant to the country's needs, balanced by involving all teachers in the same courses and wide by covering them all. However, the actual professional growth of the participants remains unclear and needs further consideration.

2. The New Education Reform and the In-Service Training Needs in Oman:

Central and regional offices of the Ministry of Education aim at directing and supporting education across the country. However, the ECS report (1995:A-5) recommends development of a balanced centralized/ decentralized organizational structure as the effective way to achieving the

Ministry goals and objectives. Indeed, front line empowerment is necessary for the new educational reform. Rigid centralized structure generates bureaucracy in decision making. Therefore, the Ministry has taken decisive steps to re-organize its administrative structure. However, this re-organization will require quality training which corresponds to the new trends in education in the Sultanate of Oman that takes account of human resources' development. The ECS (A-3) describes the human resources development as a dynamic field and needs can change very quickly as the circumstances affecting Oman's development in the global economy change. This means that the responsibility of the Department of Training and Professional Development is also required to implement training for the Ministry staff as well as for the teachers.

2.1 The New Education Reform:

The Ministry of Education in the Sultanate of Oman has taken reform of education seriously; covering all dimensions from administrative structure to structure of the school. Instead of the students going into 6 years of elementary, 3 years preparatory and 3 years secondary, they will be taught 10 years of basic education levels 1-4 and 5-10 and 2 years of secondary education.

At the ministerial and administrative level there is organizational reform. New departments have been created while others were combined to lessen bureaucracy and provide a direct focus on important issues in education. It is also meant to increase the effectiveness of the different units and uplift the standard of their functional efficiency.

At the school level the Ministry is planning to reform the structure of the buildings and furnish and equip schools to meet the new trends in education and the Basic Education Schools that are going to be opened in September 1998. It is also planning to have more teaching periods which will result in a longer school day and a longer academic year in accordance with the international trends. This will necessitate the abolition of the two shifts system in all schools.

At the Curriculum Department of the Ministry of Education, new curricula are being prepared for English, Mathematics and Science. All other curricula are also being revised. Life skills will be introduced and taught as a new subject in the Omani schools. The English language will be taught from class one in the Basic Education Schools. Computer laboratories and learning resource centers will be a new addition in the Omani schools. The introduction of computers in the schools and enhancing English teaching will certainly promote interconnectedness with the outside world in the long run.

2.2 The Training Needs:

From the above details about the education reform in the country one can sense the huge responsibility faced by the Department of Training and Professional Development to prepare and develop the human resources who will be involved in the educational reform. There will be a need to:

1. Prepare teachers and other technical staff to play their roles in the reform effectively.
2. Train the Basic Education staff- headmasters, assistant headmasters and senior teachers.
3. Train supervisors, learning resource centers' staff and other senior administrative and technical personnel at both the central and regional levels.
4. Upgrade the qualifications of TTC graduates to university degree standard.
5. Provide chances for post graduate studies such as diplomas, MA and Ph.D degrees for qualified members of staff involved in the implementation of the reform of education. This will provide local experts who will be available when the Ministry needs them. They will be better informed about issues that require understanding of the Omani society and its culture.

2.2.1 Learning Resource Centers and the Training Needs:

The expert responsible for the development of Learning Resource Centers (LRC) that are going to be introduced in the seventeen Basic Education schools to be opened in 1998 defines LRC as "A room in a school where material in all formats (printed, electronic, kit, film, etc.), are organized and made available for use by teachers and students both for curriculum related teaching and learning and for independent study by groups and individuals".

The philosophy of the reform stresses the need for problem-solving and child-centered educational approach. In the new educational reform LRCs are essential part of the planned educational structure. The LRC is viewed as a key that will generate this teaching and learning approach. Indeed, LRCs provide resources and a focal point to support teachers and encourage independent learning in children. In a document prepared by the LRC expert she states that "The personality of the teachers selected is of prime importance. They must not be devoted to rote learning methods and be willing to try new ideas and approaches".

2.2.2 English Language Teaching and the Training Needs:

The English Language Curriculum Department (ELCD) has made an enormous effort to develop professionally school teachers and ELCD staff. The currently implemented scheme for inservicing the teachers of English across the nation and its own staff is a model for the other departments to follow. Over two decades it has implemented successful teacher training programs. These programs are characterized by their progressive nature. All TTI graduates were upgraded to TTC graduates as part of the national program in the early 90s. Currently, the department is preparing itself to upgrade all TTCs. to a B.Ed certificate. Furthermore, the department has training teams that run training courses in the different regions of the country. Examples of the courses are: Regional English Improvement Course (RELIC). It is a two year course leading to a Cambridge University certificate. Higher Omani Teacher Development Course (HOTDC) is the highest level course. Senior English Teachers course (SET) is designed for proposed senior English teachers. Graduate Regional Language Improvement Course (GARLIC) is designed for university graduates. Preparatory Language Course is designed to help teachers go smoothly through the B.Ed program.

The above courses are not an exhaustive inventory of the courses run by the ELCD. The following schedule gives a vivid picture about the attention given to in-service training.

The wide variety of the courses offered are aimed at providing some sort of training to all categories of English teacher whether they are university graduates or TTC graduates. The progressive nature of the programs is important for the gradual professional development of the teachers of this subject.

In my opinion, the ELCD's experience in in-service training is a successful one and sets a good model for the other curriculum departments and even for the Training Department to follow.

2.2.3 The Training Needs for Mathematics and Science:

The ECS report makes several recommendations regarding the training needs for teachers of Mathematics and Science. These recommendations include:

- All teachers from Grade 1 on, who are or will be teaching mathematics and

Course Scenario 1997-98

REGION		COURSE			DURATION	NO	RTT/A	LOCATION	DAY	STARTED 1997	INTENSIVE WEEK
BATINAH	RELIC				1996-98	12	Kevin Higgins	Mariam G/S Bidaya	Sat	06-09-97	
		GARLIC			1997-98	11	Kevin Higgins	Sohar Boys Tech	Mon	30/08/97	3-7/11/98
			PLC		1997-99	11	Andrew Blackmore	Sohar Boys Tech	Mon	30/08/97	30/8/97 - 3/9/97
			PLC		1997-99	13	Andrew Blackmore	Sohar Boys Tech	Sun	14/09/97	10-16/11/98
				SET	1997-98	14	KH + AB	Abdulla Ibn Al Abbas B/P (Al Khodrat	Tues	16/09/97	10-16/11/98
MUSCAT		GARLIC						Sohar Boys Tech	Wed	17/10/97	10-16/11/98
			PLC		1997-98	11	Andrew Douglas				
				SET	1997-99	15	Michele Ni Thoghdha	Wattayah	Sun	14/09/97	10-14/11/98
					1997-98	14	AD + MT	Wattayah	Mon	15/09/97	3-7/11/98
BAT/SOUTH		GARLIC						Wattayah	Tues	16/09/97	17-21/11/98
			PLC		1997-98	7	Alan Rudderham				
				SET	1997-99	14	Ryan Jenner	Sha aiba Elem. Boys	Mon	22/09/97	10-14/11/98
DHAHIRA					1997-98	14	AR + RJ	Sha aiba Elem. Boys	Sun	21/09/97	3-7/11/98
		GARLIC						Sha aiba Elem. Boys	Tues	23/09/97	17-21/11/98
			PLC		1997-98	15	Wayne Jones				
				SET	1997-99	15	David Puddiford	Al Murta ata Boys, Ibri	Sun	12/10/97	
					1997-98	14	WJ + DP	Al Murta ata Boys, Ibri	Mon	27/10/97	
DAKHILIYA	RELIC							Al Murta ata Boys, Ibri	Tues	14/10/97	
	RELIC				1996-98	16	Anthoy Lamb				
	RELIC				1996-98	13	Anthony Lamb	Agricultural College Nizwa	Sun	31/08/97	3/11/98 - 7/11/98
	RELIC				1996-98	14	William Ferguson	Harith bin Malik E/B Ghafat	Sat	30/08/97	10/11/98 - 14/11/98
SHAR NORTH	RELIC				1996/98	11	William Ferguson	Nizwa Agricultural College	Wed	03/09/97	10-14/11/98
	RELIC							Sumail Jededah	Tues	02/09/97	3-7/11/98
					1996-98	11	John Rocha				
			PLC		1996/98	14	John Rocha	Mudaibe Idara Seminar Room	Tues	16/09/97	27-31/12/97
					1997-99	13	John Rocha	The Idara, Ibra	Sun	14/09/97	27-31/12/97
SHARQIYA		GARLIC						The Idara, Ibra	Mon	15/09/97	3-7/11/97
			PLC		1997-98	9	Andrew Houghton				
				SET	1997-98	16	Simon Emerton	Sultan bin Murshid (Al Esha)	Mon	29/09/97	
					1997-98	14	SE + AH	Al Wafi Prep G/S	Mon	29/09/97	3-7/11/98
DHOFAR	RELIC							Al Wafi Prep G/S	Wed	01/10/97	
		GARLIC			1996-98	18	Kathy Bird				
			PLC		1997-98	12	Kathy Bird	Assaada Training Centre	Wed	08/09/97	3-7/11/98
			PLC		1997-99	13	James Williams	Assaada Training Centre	Sat	04/09/97	17-21/11/98
				SET	1997-99	12	James Williams	Assaada Training Centre	Sun	05/10/97	3-7/11/98
					1997-98	11	KB + PB + FZ	Assaada Training Centre	Wed	08/10/97	17-21/11/98
TOTAL				PRINT	1997-98	15	James Williams	Assaada Training Centre	Sun	05/09/97	10-14/11/98
8 Regions	PRT							Assaada Training Centre	Mon	11/10/97	11-15/10/98
						392					
					1997-98	108	Gillian West				
							Justine Mercer	Muscat			
							Alan Rudderham				
						500					

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science, should receive during 3 successive years, a 2-week in-service training course on the new program.

- The program for Mathematics and Science teachers at the Teachers' Training Colleges of Education should be revised to ensure that it provides a firm basis for teaching the new program.
- Headmasters and Assistant Headmasters should attend the in-service teacher training course outlined above.
- The Ministry's training course for Headmaster and Assistant Headmaster candidates should be revised to ensure that at least a general understanding of the objective and nature of the new Mathematics and Science curricula will be included.
- Regional Mathematics and Science Implementation Committees must be established in each region and meet monthly.
- After the main implementation phase, a program of mathematics and science workshops should be put into operation. These should be of one or two days duration, should be scheduled at least twice a year, and should be observed by officials of the Curriculum Development Department. Their purpose would be:

  To stimulate professional discussion among mathematics and science teachers.

  To share successful strategies and methods.

  To discuss problems and difficulties and find solutions.

  To provide feedback for the ongoing revision of the curriculum and its supporting materials.

The above recommendations make it clear that pre-service and in-service education should consider the new trends in the teaching of the two subjects. In my opinion, teacher education should be redefined to include the new aspects and trends in the new curricula. The experts responsible for the development of the new curricula for Mathematics and Science put forward the following suggestions:

- All Grade 1 and 2 teachers who will be teaching in the 17 Basic Education Schools scheduled to open in September, 1998 should have the suggested 2 weeks of in-service, in either one of the following 2 ways:
- One week of in-service before the program starts with an additional 5 days of in-service interspersed throughout the school year, or, if that is not possible,

- two weeks of in-service before the program starts.

The focus of this in-service training should be on the new curricula including:

- the philosophy of the new curricula.
- the nature and format of the new Teachers' Curriculum Guide.
- the suggested methods of teaching Grade 1 and 2 mathematics and science.
- the use of mathematics manipulative and science equipment as a strong component in the program.
- the use of the Teachers' Materials Activity Guide in mathematics and the use of the Teachers' Curriculum Guide in science as a source of assignments rather than a student "textbook".
- the use of calculators and other technologies.
- the role of teacher supervision.
- methods of day-to-day assessment of children and methods of overall evaluation.

The method of delivery of the teacher in-service. the in-service is NOT to be given as a lecture, but rather will model various techniques that teachers will use in their own classrooms.

The interesting point here is that these suggestions corresponds with my suggestion for the need to redefine teacher education. The training needs are directed towards the new philosophy of education and new additions in the new curricula.

2.2.4 The Training Needs for the Other Subjects:

Changes in the Arabic, Islamic and Social Studies subjects curricula will necessitate training in child-education and a philosophical introduction to the new educational reform is needed to the teachers of these subjects. In addition, curriculum guides must be developed and explained so that teachers have guidance on teaching according to the methodology which should ensure the required educational outcomes. To achieve the level of effective teaching, curriculum guides, new materials and texts must be created and explained with sufficient time allowed for teachers to internalize the work and make up enough lesson plans so that they are confident and comfortable with the new material. In the training plan that was especially prepared for the Basic Education

Schools it is stated that "it would be necessary for the subject departments which created the new curricula to in-service them since their staffs would possess the knowledge they would want to convey. If a new curriculum guide is not in-serviced, teachers will not know what to do and the reform will not succeed". (P 3) In other words in-service training must include two main areas, namely: philosophical orientation and curriculum introduction.

3. Computer Awareness Among People in the Education Field in Oman;

Increased use of computers and future anticipation of dependence on computers in all domains has lead to what is being called the computer age. In the computer age the word " literacy" is used to include computer knowledge and awareness. Thus, an illiterate in a country such as Japan is probably different from an illiterate in a developing country. A book edited by Siedel, (1995:3) mentions "the ability to deal effectively with information technologies in business, industry, government, and increasingly in our homes and schools, has created a need for what has been called "computer literacy". The ability to understand computing is becoming as important as our ability to understand and handle the written word. A computer literate populace is as necessary to an information society as raw materials and energy are to industry". Further it also states that " there is an urgent national need to create an education system that fosters computer literacy in our society" P(4).

Oman is taking serious steps to foster computer literacy among school staff and students. Computers will be installed in all Basic Education Schools. Therefore, the Training Department is required to deliver training and spread computer awareness among school staff and students. Teachers and students must be trained on how to benefit and get the most from this technology in schools. However, before planning any training the Department needs to conduct a needs' assessment. The following question should be answered: how much do people in the field know about computers and computer aided-learning?. As an attempt to answer this question I carried out a questionnaire survey addressed to the followings:

Category	Male	Female	Aim
University students	7	20	To find out role of university
School teachers	9	14	To find out the current status.
Inspectors and administrators	18	2	To find out the role of position

These categories were selected because it is assumed that they have direct links with the education process. In addition, university students who are going to be teachers were selected to find out the role of institutions in spreading computer literacy.

Since it was difficult to travel to each region and select a random sample, I used people who attended in-service training course in the Training Center as samples. These people are presumed to represent the above categories because they come from all regions in Oman.

Analysis of the questionnaire revealed that there were three people who answered No to the question: do you know what is a computer? Most of them answered Yes because they thought if they have seen a computer that means they know what a computer is. The second question asked about the place(s) where they used computers. Interestingly, more than half of the third category above have not used a computer yet. Most of the teachers answered at home while most of the university students used computers at the university. This means that there is a probability that computer knowledge is spreading slowly among older age people and faster among students. Furthermore, educational institutions play major roles in the spreading of this knowledge.

Five from the inspectors / headmasters, three from the students and four from the teachers have personal computers and those who used computers used them for word processing. However, all of them answered Yes, to the question about their willingness to attend a computer program course. About half the number are ready to pay for their own training on computers and all of them thought that computer introduction in the schools will ease the teachers' work.

The questions about the Internet have not been answered since none of them used the Internet.

Recommendations:

This simple survey has indications that the Training Department should target administrators and inspectors at the first stages of computer training since they know least about this technology. In addition, teachers should be encouraged to join computer courses whenever possible. Finally the Department needs to strengthen ties with the University and the Teacher Training Colleges to assure itself that new graduates possess the needed knowledge about computers. Educational uses of computers and the Internet should be initiated by the Training Department since none of the surveyed people have used it.

4. The Department of Training and Professional Development:

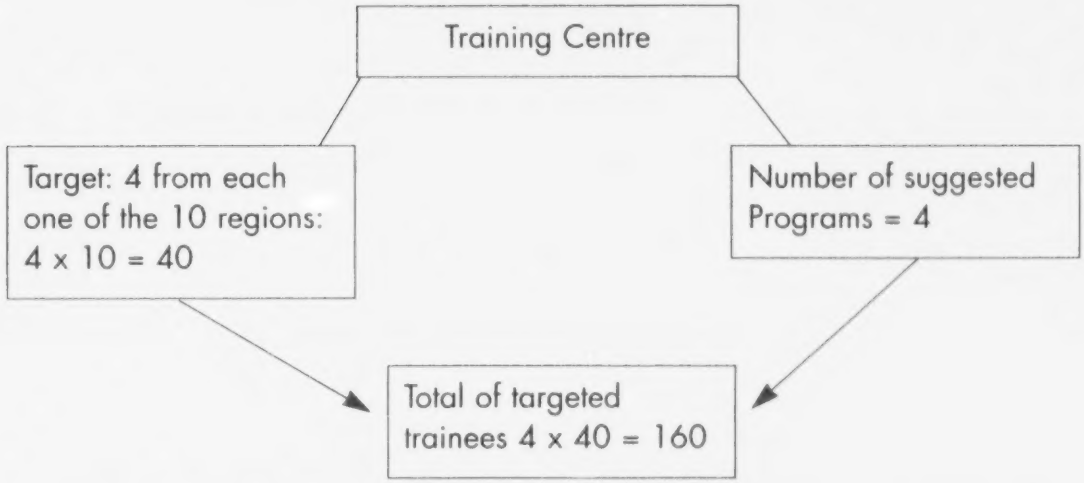
The Department of Training and Professional Development did not waste time observing and waiting to be asked what to do. It immediately embarked on planning the training that will accompany the educational reform. Thus, over the first half of 1997 a comprehensive training plan has been devised for the Basic Education School personnel. Yet, it should not be understood that this department has been created solely to provide the training for the Basic Education Schools. It is considered by the Ministry of Education as responsible for all in-service training in the administrative and professional domains. Thus, the Department's work can be categorized into three areas: a) educational workshops and in-service courses for school teachers and regional staff; b) administrative courses for the Ministry staff; c) planning for the training of the Basic Education Schools' personnel.

a) Educational Workshops and In-service Courses:

These are courses run centrally at the training center for candidates from each region including heads of the Training Sections in the regions, inspectors, headmasters and distinguished teachers who in turn will be asked to implement and run the same course(s) correspondingly in their regions. The good thing about these courses is that they are run in response to feedback gathered from the field, mid year reports of the new teachers, and from the identification of the regional training needs. According to the General Achievement Report of the Department of Training and Professional Development for 96 / 1997 the following outcomes are sought:

1. Increasing the number of trainers and developing their professional skills in the regions.
2. Expanding training opportunity for people who work in the education field to get one training opportunity every two years.
3. The production of training materials which can be used by the training sections in the regions when needed.
4. Continuous provision of skills and experience to people who work in the training field.

The following chart shows the number of implemented programs at the training center in 1997.


Training Centre
Target: 4 from each one of the 10 regions: 4 x 10 = 40
Number of suggested Programs = 4
Total of targeted trainees 4 x 40 = 160

The above courses are supposed to be implemented in each region for about 30 candidates. So, 30 candidates x 40 programs = 1200. Then, at the school level 4 schools in each region who attended the regional workshop or training course will be spreading the knowledge to 15 candidates in each school. Thus, 4 x 15 x 40 = 240 x 10 =2400 . The total number will be 160 central + 1200 regional + 2400 at the school level = 3760. It is worth mentioning that there are more than 11000 Omani teachers in the field beside a similar number of expatriate teachers and school headmasters.

b) Administrative Training:

The Department of Training has a plan for the administrative training designed for the Ministry staff. The plan takes care of programs needed for individuals in different positions. After gathering the training needs for each department the Department of Training classifies and prioritizes the different programs. Usually private institutions are hired to implement these programs.

c) Basic Education Schools (1-4) Training Plan :

Since the new education reform is based on a new philosophy of education, new curricula are being prepared for the Basic Education Schools and require a new structure of school buildings. These areas have to be taken into account in the training plan. I think, one of the issues that has to be considered is the new role of the teacher. Teachers in the Basic Education Schools will be urged to change their role in the classrooms from lecturers to facilitators. They will be monitoring and guiding because child-centered education is one of the main goals of the new reform. Therefore, the quality of teacher training should be targeted at changing teachers' behavior in the classrooms.

The classroom organization should be balanced between sitting and doing, receiving knowledge and applying it. One of the most important points about LRCs in schools is that their purpose should be fully understood by all the teaching staff so that the resources provided are fully utilized. This understanding will not come without the proper training that should be delivered to the teachers by the Training Department or the LRC teachers. As I have stated earlier the teacher's role should shift from teacher-centered to child - centered learning. The students' role will shift towards doing, reasoning and applying as opposed to passive knowledge receiving and rote learning. This reform emphasizes the active involvement of students as they take greater responsibility in the educational process. The students' inquisitiveness and intelligence must be stimulated and developed so they can become effective problem-solvers, self-motivated and life-long learners. The students' understanding of How (ability to solve problems) is more important in facing the problems of the future rather than the What (rote learning) though both should be balanced in the educational process. To achieve this level of understanding and attitudinal change, Basic Education Schools staff must be given an effective orientation to the proposed educational reform at the student-learning level. Analysis of the training plan reveals that it is a comprehensive plan that has included programs for all the personnel of the Basic Education Schools on most aspects of philosophical, curricular and structural training needs. The following courses, which are included in the training plan, will give a clearer picture about what will be covered:

Orientation workshop	1 week	10 times
Training of trainers	1 week	5 times
Management of change	3 days	3 times
Model schools planning	2 days	3 times
Computer course	3 weeks	10 times
Senior teachers	5 weeks	2 times
LRC teachers	3 weeks	5 times

In the regions, the following courses are planned to take place:

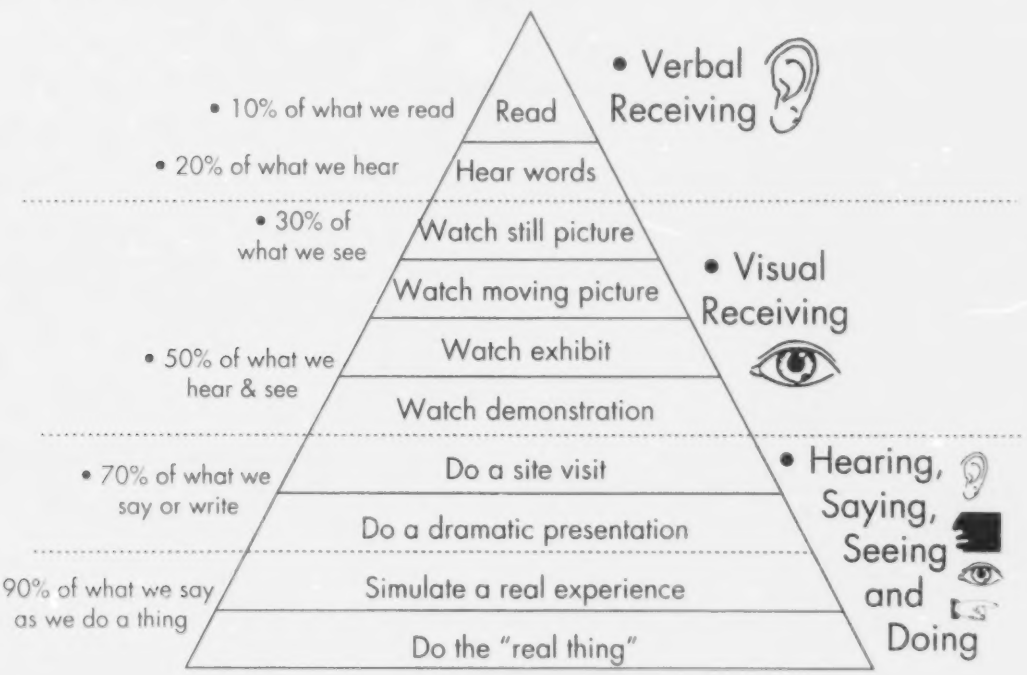
Class management	3 days	8 times
Training of trainers	3 days	8 times
Supervising and leadership	3 days	8 times
Questioning in the classroom	3 days	8 times
Classroom visit and observation	3 days	8 times
Skills of training	3 days	8 times

Basic Education Training Plan (P 11)

Computer programs and senior teachers' programs are among the dominant areas in the plan. The prevailing role of the senior teacher in the Basic Education Schools has received the consideration it deserves. Besides the five weeks centrally run for senior teacher program, many of the local training programs include aspects that help the senior teachers to play their roles efficiently. According to the training plan they will be receiving training in areas which correspond to their job descriptions. In addition, they will be given computer training in Windows, Word processing, Excel, Graphs, Powerpoint, ...etc.

The role of the teacher as a whole as discussed above has been an important issue in the training plan. The plan suggests that the mode of the training courses and workshops should be balanced according to the Edgar Dale's "Cone of Experience"

Training workshops that are delivered according to the mode below will set a model for the teachers' own teaching. Imitation is probably more effective in changing mentality than telling somebody what to do.


• 10% of what we read
Read
• Verbal Receiving
• 20% of what we hear
Hear words
• 30% of what we see
Watch still picture
Watch moving picture
• Visual Receiving
Watch exhibit
• 50% of what we hear & see
Watch demonstration
Do a site visit
• 70% of what we say or write
Do a dramatic presentation
• Hearing, Saying, Seeing and Doing
Simulate a real experience
• 90% of what we say as we do a thing
Do the "real thing"

Synthesis:

One can say proudly that in-service training has a good record of achieving the Ministry of Education goals throughout the development of education in Oman which started in 1970. At each stage of the development of education

in-service training has played an important role in inservicing Ministry staff and teachers according to the needs of each period. For instance, in the 1970s the primary aim was to in-service teachers who were sent to the schools without previous training. Later, the focus was on the continuous professional development of the staff and teachers. In the early 1990s there was a need to upgrade the TTI graduates to TTC certificate to meet the school needs. Currently, the reform of education has to be met with special training that helps staff and teachers to accept educational change and cope with it. The changing role of in-service training has always been driven by the changing needs of the Ministry of Education. Hence, one can describe the structure of in-service training in Oman as dynamic. Dynamic in the sense that it is ready to respond to the current philosophy of education.

If in-service training has a good record of achievement and is dynamic, the question which lends itself is: Is there a need to redefine teacher education? One can answer this question by saying yes. This answer is based on three main reasons. First, in-service training has always been driven by Ministry needs rather than the personal needs of the staff and teachers. Therefore, in-service training should be flexible so that it can serve the personal interests of the individual in addition to meeting Ministry targets. It should be available to all in subject areas where they feel comfortable. This should not contradict with Ministry needs because they are always a priority, but can enhance the individual's proficiency.

Second, in-service training cannot continue to limit itself to issues related to classroom practices, though they should be a priority. The thinking of the people who work in the Training Department should be focused at accommodating new innovations in the educational field in the context of Oman. The Department has to avail the Ministry personnel benefit from the developments in technology. For instance it should initiate the use of computers and Internet services in the educational field. People need to be shown how to benefit from such technologies. Living in an interconnected world requires flexibility, openness and broader knowledge. Computer technology and the Internet can be the tool used to acquire broader knowledge.

Third, in-service training has to consider the issues of progression, balance, differentiation and depth and breadth as discussed previously. A structured system is important to keep track of the training needs and to give the right training to the right people at the right time.

In brief, it is the time to enhance the effectiveness of the in-service training by infusing aspects from the areas discussed above. Everyone should have an opportunity for professional development so that Omani citizens can function efficiently in today's exciting, technologically challenging and economically linked global environment.

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Supporting Teachers' Professional Learning

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INTRODUCTION

Teacher education is one of the subjects that have recently gained considerable attention from researchers in the field of education. This is unsurprising since it is widely acknowledged that the teacher is the main key to a successful education system in any community.

In the last few decades, educators have offered a number of theories and concepts about teachers professional development based either on personal experiences or on attentive research into teaching as a practice that is tightly linked with societies and their requirements. However, in the approaches that were used, the concept of teacher education varied and still, even now, the literature offers new insights into the subject almost everyday.

Day et al (1987) maintain that teachers were traditionally perceived as practitioners only. They had to be told by other people what to do. Nevertheless, teachers gradually became resistant to outsiders' interference in their job; they believed that what they did in their classrooms was their own business. Consequently, this has contributed in developing the general understanding of how teacher's professional development should be approached.

In the early seventies, there was a belief that in-service teacher training should begin in schools, where teaching take places and needs are identified (Department of Education and Science (DES), 1972). This trend was supported by some other notions such as teachers' autonomy, the continuity of professional learning and teachers' professionalism. Subsequently, the literature depicted that "teachers should view themselves as owning the project (staff development program) and being in charge of the process".

Recently, a number of approaches to teachers professional development based on the previous concepts were offered in the literature such as school-based, school-focussed and school-centered. However, there in an opinion that teacher education conceptualization is moving towards being entirely the decision of teachers themselves (Whitaker, 1993).

Accordingly, the idea of this paper is to suggest that professional development is not something to be imposed on teachers in any way. Instead, it is something to be learned gradually by teachers themselves throughout their lives under particular conditions. To achieve this, the paper is divided into six main sections, namely: definition, the importance of professional learning, the reality and teachers professional learning, towards professional learning, the role of the leadership and external help. Finally, there is an attempt to draw some conclusions from what is mentioned in these six sections.

DEFINITION

The relevant literature depicts a plethora of terms related to staff development generally. Each of those terms reflects different aspects of teachers' professional growth. Therefore, it is essential to start by defining the term 'professional learning' and clarifying the distinction between this term and the most common term used in this domain namely 'professional development'.

Apparently, not much has been written about the professional learning of teachers as an independent theme in the literature of staff development in schools. Rather, this is usually discussed as a part of staff development. Consequently, determining the generic and specific of these two terms might be debatable.

Day (1994) suggests, at some length, the following scholarly definition of professional development: "professional development consists of all those conscious and planned activities which are intended to be of direct or indirect benefit to the individual, group or school and which contribute, through these, to the quality of education in the classroom. It is the process by which, alone and with others, teachers review, renew and extend their commitment as change agents to the moral purpose of teaching; and by which they acquire and develop critically the knowledge and skills essential to good professional thinking, planing and practice with children, young people and colleagues each phase of their teaching lives".

Although it might be understood from this definition that professional development contains both classroom practices and professional knowledge, some writers, however, tend to ascribe only the latter to professional development whereas they ascribe the former to another term that is 'staff development' (Francis, 1991).

Additionally, Day's definition shows that professional development occurs through "conscious, planned and intended activities" which does not apply to

'professional learning' that happens 'naturally' without being controlled by anybody (Day, 1994). This understanding of the professional development of teachers does accord with another definition suggested by Billings (1977) who asserted that professional development is "a deliberate and continuous process".

Accordingly, some sort of contradiction might be realized here between the two terms, professional development and professional learning, the former is planned whereas the latter is not. However, this differentiation does not, in itself, imply any kind of preference for one of them; but it is an insight into the meaning of the title of this paper. Hence, the term 'professional learning' is used here as something analogous to the natural unplanned (but can be planned) process by which teachers in schools consciously or unconsciously develop their professional knowledge and practice.

THE IMPORTANCE OF PROFESSIONAL LEARNING

Accepting the concept of professional learning inevitably leads to accept that teachers are constantly learning new issues about their profession everyday throughout their lives; as articulated by day et al (1987) "teachers gain new perspectives, increase their knowledge and skills as a natural part of their working lives". This type of professional growth is more significant than most if not all other types for many reasons as clarified below:

Teachers are thinking human beings:

It is commonly noticed that teachers are perceived as practitioners only, while academics in higher education establishments are responsible for providing teachers with educational theories that have to be followed in practice (Knight et al, 1992). This perception of teachers' role in schools has contributed in creating some barriers to teachers' professional learning. In a case study about collaborative professional development in a primary school, one of the schoolteachers says: "I have not had time to put into practice the ideas I formed at college. There is always something new being introduced that you have to do" (Sellars and Francis, 1995).

However, it is generally recognized that a good theory is derived from good practice and good practice is derived from good theory as mentioned by Fullan (1992). That is why McNiff (1990) argues that teachers, as 'thinking persons', should be concerned with improving their pedagogic knowledge and educational practice. Further, the literature depicts that the best practitioners are the ones who can bring about improvement and development in different

aspects of education systems (see fpr example Whitaker, 1993). Therefore, teachers should be regarded as both researchers and practitioners. As a result "it follows that an issue or problem which others identify may be perceived as irrelevant or not worthwhile unless they (teachers) themselves can be convinced of its validity" (Day et al, 1987).

Teachers' personal traits:

Teachers as thinking human beings are different from each other in the way they think and behave. Originally. this notion was taken from individual differences and trait theory in psychology; then it was applied to the realm of education. In her article titled 'writing and the creation of educational knowledge' McNiff (1990) points to the idea that "education is what goes on in the individual mind". Many pre-service teachers and teachers educators conceive learning to teach as a matter of being able to carry out ones individual way of practicing the profession of teaching. Consequently, there is no good and bad teaching but there are differences between teachers in their performances reported by Hursh (1995).

In this sense it can be said that designing particular programs for professional development of teachers in schools without considering the individual differences of teachers will not always have the intended impact on the quality of teaching; whereas professional learning as defined earlier much more likely to allow teachers to learn more about their practice in a way that meets their individual abilities.

Learning is a lifelong activity:

Day et al (1987) states that "learning seen is seen as a lifelong activity". This feature of learning might suggest that learning is more than professional development programs and workshops, simply because this type of professional growth is often restricted to particular times and places. While what teachers need is the type of professional growth that meets their 'lifelong professional needs'. Hargreaves (1993) argues that these needs cannot be met unless they are treated as continuous and progressive needs.

Generally speaking, relevant literature shows that researchers are not oblivious to this aspect of professional growth requirements. Thus, they constantly assert that appraisal schemes and staff development programs must be regarded as a continuous process for teachers. For instance, Evans and Tomlinson (1989) like others raise the question of how often should the teacher appraisal be, then they join the convoy of debate over this issue among researchers.

However, irrespective of whether the answer to this question will be once, twice or three times a year, we should be aware of the continuous and rapid changes that occur in the realm of education nowadays; which means that people are required to "learn afresh at intervals throughout their lives" as suggested by Dean (1991). In other words, professional development programs and courses are not sufficient sources of professional growth for teachers; they need something more than that.

Explicit and implicit knowledge:

It is axiomatic that teachers, like other people, learn from their daily professional and personal lives. This long-term process of learning allows teachers to accumulate a body of knowledge in their minds. Further, we cannot re-call everything we have learned in our lives but we know in most cases how to react properly in new situations according to our experiences and previous knowledge; and the same with teachers. In many cases they improve their practices according to what they have encountered in their lives.

This implicit knowledge is known in the literature as tacit knowledge according to Polanyi (1958). Moreover, some researchers tend to believe that this level of knowledge enables teachers to make sound educational decisions although they might not always be able to justify their decisions and explain their opinions theoretically as academics do (Carr, 1989). Evidently, this idea seems to be theoretically acceptable; not only on the part of practitioners but also on the part of academics since they are usually dependent on practitioners in their research.

However, from this understanding of tacit knowledge it might be generally accepted that this type of knowledge is characterized by individuality. In other words, the tacit knowledge of every individual teacher (or group of teachers) is based on his or their own working conditions. Hence, the findings of research that can be used to develop teachers professionally in a particular set of conditions might not necessarily be applicable to another set. In turn, this may suggest that the concept of professional development as offered in the literature is not always effective.

Teachers as reflective practitioners:

The notion of considering teachers as reflective practitioners was started by Schon (1983) in his book 'the reflective practitioner'. Furthermore, it seems that the idea itself is built on the above mentioned idea; tacit knowledge, in its conception as explained. The chief term in this respect is reflection-in-action

which simply means that teachers as practitioners use their tacit knowledge as a means by which they review and improve their practices.

In Schon's words "the knowing-in-action is tacit, spontaneously delivered without conscious deliberation; and it works, yielding intended outcomes so long as the situation falls within the boundaries of what we have learned to treat as normal" (Schon, 1987, p.28).

The importance of reflection-in-action has been widely accepted among writers in the last two decades (although there is some criticism about it; see for example Eraut, 1994) not only because reflection leads to new concepts, skills and knowledge but also because it is an essential ingredient for "survival in classroom" (Day et al, 1987). In a number of schools in Oman a group of teachers were asked to list some technical problems they encountered in the early stages of their professional lives and how they managed to avoid them after that. The results of this piece of work showed that most of those teachers unconsciously used the means of reflection-in-action as a method for avoiding the same problems in the late stages of their professional lives.

Eventually, teachers as reflective practitioners might reject ready-designed programs for professional development; mainly because they are based on the past or current problems for teachers; they usually talk of the future with great uncertainty and in many cases the practice shows that a particular theory is not consistent with the reality of teaching, basically because some conditions have changed after a few years. In such situations as this, it can be generally said that reflection occurs automatically as a flexible way of dealing with problems and developing professional abilities.

THE REALITY AND TEACHERS PROFESSIONAL LEARNING

All those five features of teachers' professional growth reflect the importance of professional learning as a means of achieving teachers' professional development. Furthermore, the reality of interaction between teachers and various types of planned or unplanned professional development activities supports the idea of professional learning.

One of the problematic issues regarding teachers' professional development is that some writers misuse some commonly used terms in this domain. Subsequently, they offer narrow meanings of professional development and hence they transmit these meanings to the reality in schools. Francis (1991), for example, points to the use of the term 'staff development' and how some people understand it as a program that takes place "at specific

times during each school year". It is apparent that such understanding as this might result in molding professional development to be rigid programs, which aim at dealing with teachers as machines need a regular maintenance.

This perception of professional development as something that should be given to teachers regularly in a particular place and time has resulted in a considerable resistance to in-service professional development programs among teachers as can be found widely in the literature. Many writers believe that "professional development cannot be forced" (see for example Day et al, 1987 and Francis, 1991). Additionally, McCormic and James (1983) point to the notion of professional accountability as one of the appropriate alternatives that will make teachers seek to develop their practice instead of forcing change on them from outside. This goes hand in hand with the rejection of looking at teachers as only "the recipients of educational knowledge" and believing that "knowledge is something to be accessed" as stated by McNiff (1990).

Moreover, although there are many different, but with the same purpose, sources of professional development for teachers (such as journals, research reports and specialized magazines) there is evidence in the literature that teachers do not learn professionally from these sources as argued by Sellar and Francis (1995). Generally speaking, part of the reason for this attitude from teachers might be the feeling that academics' efforts in this field are seen as interference in teachers' job without full knowledge about the reality of teaching.

This attitude was mentioned also by Gurney (1989) who asserted that most teachers refuse educational research and theory "as a basis for making decisions about their practices in schools". Further, Day et al (1987) point to the same idea and states that teachers have improved complex systems for opposing external attempts to intrude into their job. Thus, two questions can be posed here. The first is how much do teachers benefit from professional development programs? and the second is what roles should be played by outsiders if there is any?

In addition, the relevant literature shows us that previous experience suggests that one of the chief reasons for resisting professional development programs by teachers is the threat to esteem, integrity and independence (Egan, 1982). This factor is mainly related to the psychological status of teachers as recipients of help; they are not similar in their reaction. That is why the element of readiness is one of the most significant ingredients in teachers' professional growth as will be clarified later on in this paper.

Lomax (1990) advocates what she calls a research-based approach to developing staff in schools; which means, according to Lomax, to enable teachers as practitioners to find out the meaning of their practice which will necessarily result in improving the practice rather than imposing discourses from outside. This approach can be perceived as one step further towards teachers full involvement in determining the way they should improve and develop their practices; this approach is likely, to some extent, to get rid of teachers fears about esteem, integrity and independence as mentioned earlier.

Generally speaking, "teachers need to feel involved and retain ownership of changes" as stated by Gurney (1990). The feeling of involvement and ownership is far likely to encourage teachers to benefit as much as they can from all opportunities available for learning and improving their professional skills. In other words, it will be much more likely to give the extra 'time', 'energy' and 'commitment' needed to learn from their practices (Day et al, 1987).

Furthermore, the notion of ownership justifies what is widely found in the literature that the most effective appraisal systems are the ones developed by teachers and heads in schools.

Eventually, this is the reality of teachers' professional development. Although research has developed a number of approaches such as political, managerial, administrative and restricted professional approach, we still notice that teachers are more resistant rather than being positively responsive to all these approaches; and they become more positively responsive as they are involved more in the process of deciding how to develop and improve their practices. In their case study about collaborative professional development in a primary school Sellar and Francis (1995) state that "teachers should view themselves as owing the project and being in charge of the process". This statement is another confirmation of the significance of teachers' involvement and ownership of professional development processes.

This tug-of-war over who should conduct professional development programs between practitioners and other groups in the community has created confusion about the identification of teachers' professional growth from more than one decade ago. This is mirrored by some writers like Ferman-Nemser and Floden (1986) who argued that the process of teachers' professional development is not well understood and there is no appropriate theory to explain how professional development of teachers occurs. However, it is apparent that this statement is not to argue that professional development of teachers does not occur. Instead, it is to raise the question of how does it occur or how it should be perceived by the different parts involved.

TOWARDS PROFESSIONAL LEARNING

One of the most important advantages that can be taken from the previous practices in this respect might be that they give us, to some degree, clear vision about how to plan for professional growth of teachers in the coming years.

In the next stage of this paper, 'professional learning' as defined earlier will be offered as an appropriate approach to achieve teachers' professional growth. That is to argue that professional learning is not something to be controlled but it is something to be encouraged and directed via a number of variables as shown below.

Teachers readiness:

It is axiomatic that achieving the requirements of any aspects of school work depends, to a certain degree, on how much schools' staff are willing to cooperate and do actively what they are expected to do. This is what is meant by teachers' readiness. In UK the 1978 report of the Department of Education and Science describes INSET as a "voluntary professional activity which depends for its success upon the goodwill of teachers".

Accordingly, if teachers are to learn professionally they must be ready. This readiness can generally be regarded as the most significant element to ensure successful professional learning for teachers. Sellars and Franc(1995) state that teachers can be put in a state of professional development readiness by focussing on their concerns. That is why teachers' practice and teaching problems as perceived by teachers should be the basis of professional learning in schools.

Moreover, teachers' readiness is likely to lead to different ways and approaches of professional learning among teachers without any kind of supervision as can widely be found in the literature; see for example Francis (1991) who articulates that everyday classroom observation can be adopted in some schools on an informal basis just because teachers are willing to do so and there are good opportunities for that.

Generally speaking, teachers' readiness is commonly mentioned by writers on teachers' professional growth while talking about the various approaches of teachers' professional development. However, what is mentioned about these different approaches is inevitably applicable to the approach offered here, namely teachers' professional learning.

Learning opportunities:

Readiness is essential for professional learning, but alone is not enough; learning opportunities should be available for teachers in their environment. There is a suggestion from research on adult learning that adults should be provided with an opportunity for constant directed reflection built on lived experience. In such situation as this they can learn (Sellars and Francis, 1991).

Francis (1991) points to the importance of staff library, educational magazines and newspapers as sources of professional growth in schools. These sources can be regarded as learning opportunities for teachers. It can be generally accepted that such materials can be the criteria of differentiation between the quality of teachers in different schools. Further, some school administrations in Oman use notice boards around the school to bring teachers' attention to some aspects of their practices in order to enable them to improve their performance.

Moreover, the main aims of schools should be linked with human resources development and growth (Day et al, 1987). This in most cases, leads to open all learning channels possible in school and motivate teachers to make use of every opportunity available to them in their working place.

- Staff relations:

The quality of relationships among staff is one of the crucial issues in any school; not only to support teachers' professional learning, the subject matter of this paper, but also to get things done in general terms. This is because people as human beings are different from each other. Day et al (1987) state that "school as an organization is seen as a complex and dynamic network of human interaction and relationships".

It has already been mentioned earlier that there are individual differences between teachers as human beings. Hence, it can be said that each teacher has something that others can learn consciously or unconsciously. The literature of teamwork in schools suggests that professionalism varies from one to another but they can and should benefit from each other (Bell, 1992). In order for this to happen there must be positive relations among school staff. The literature suggests that all collegial approaches to appraisal and staff development rely, to a great degree, upon the element of good relations. For instance Day et al (1987) state that trust and openness are some conditions under which appraisal require to be conducted.

Further, studies about school improvement, teacher preparation, professional development and the implementation of innovations have all shown that teacher-teacher and teacher-administrator relations do make a difference in the outcomes (Little, 1987).

Accordingly, in the context of professional learning the quality of relations among school staff is essential. Basically, because they determine what is to be learnt. Rosen (1989) maintains that the work environment, in many cases, might inculcate good or bad behavior in teachers personalities especially new teachers who are entitled to be trained by experienced teachers.

Finally, the literature is full of learning relations between teachers that can be regarded as positive manifestations of good relations in school. For example in his article titled 'involving the whole staff in developing a math curriculum' McTaggart (1990) points to the importance of 'critical friends' in professional learning in schools. He concludes his article by saying "two of the staff used as critical friends have probably given extra support and guidance throughout the project and their contribution deserves a fuller acknowledgement.

Moreover, teachers good relations means minimizing the distance between teachers which is likely to establish healthy professional discourses in schools. These educational professional discourses appear sometimes as daily dialogues and conversations between teachers. They are known in the literature as story-telling which is a natural and powerful process for teachers to explore and develop their professional knowledge as widely acknowledged in the relevant literature (see for example Halliwell, 1993).

Generally speaking, good relations in schools should be the ground on which the activities of school should be based. Subsequently, teachers' professional learning will automatically occur consciously or unconsciously; whereas bad relations in schools are likely to make schools a battle ground where staff fight each other under a culture of micropolitics as described by Wilkinson (1987).

Professional learning needs time:

It might be generally accepted that a teacher's day is like a circle that is very difficult to find its starting point and its end. Responding to my question about how does he spend his day one teacher from primary school said "in the school I have got my daily timetable, pastoral care, some administrative work, meeting parents and sometimes attending some school meeting; in my house

after having lunch and some rest I have to prepare for my next classes, make some teaching aids and mark homework". Regardless of how many students this teacher teaches, it is clear that he has a lot of things to do not only in the school, but also after he goes back to his family. This necessarily introduces the question of how much time does this teacher find to think about how to improve his teaching? Day et al (1987) answer this question by stating that only few teachers find enough time to systematically reflect on their thinking and practice.

Although professional learning is a lifelong activity as mentioned earlier, teachers need time to review their practices and refresh their knowledge otherwise professional learning will not properly occur. Some studies on collaborative professional development suggest that time release must be built into schools structure if this type of teachers professional growth is to succeed (Sellars and Francis, 1995).

The relevant literature offers several ways to learn from the different sources available in schools such as clinical observation, peer observation and school library. Consequently, teachers might be released for one or two hours a day and encouraged to benefit from these sources in a way or another. This is not to program professional learning but to give teachers time to decide how they can grow professionally; what to read and who to observe. Time is a very significant factor especially when we know that teachers sometimes "need more time to reflect than a normal teaching time" as argued by Day (1993).

Professional learning needs teachers' autonomy:

Professional learning as defined previously is basically to allow and encourage teachers' natural abilities to grow professionally from their day-to-day contacts throughout their lives. This conceptualization of teachers professional learning should necessarily go alongside the notion of teachers autonomy; especially because the literature suggests that teachers as professionals prefer working individually (Bell, 1992). This is not to suggest that individual work is better than collective work; instead, it is to suggest that every individual teacher can and should identify his own contribution in the collective work instead of being ignored as an individual in a group.

Further, in his book, Bush (1995) argues that "teachers require a measure of autonomy in the classroom but need to collaborate to ensure a coherent approach to teaching and learning". This statement is based on students learning but at the same time it does apply to teachers learning as mentioned

above. For that professional learning is a process of being able to learn by your own from the learning environment around you in order to improve your contribution in the collective work of your organization.

THE ROLE OF LEADERSHIP IN PROFESSIONAL LEARNING

So far this paper has shown the importance of professional learning for teachers and how it can be achieved in the reality that does not pay much attention to this approach as an effective means of ensuring teachers professional growth. However, although what has been mentioned is essential, there is still one element of the same degree of importance should be addressed here: that is 'leadership'.

It is generally accepted that when two teams, one with a leader and the other without a leader, are asked to accomplish the same task, probably the former will be quicker and more accurate in accomplishing the task than the latter. This illustration tells us how crucial leadership is to any piece of work that demands collective effort and that is why Bell (1992) maintains that school management will be effective only if based on successful leadership.

Moreover, staff development literature argues that the variety of approaches to staff professional development are no substitute for continuous staff management (see for example Day et al, 1987). However, the continuous staff management mentioned here depends, to a great degree, upon the quality of leadership since there is evidence suggesting that the collegial approach of leadership is more likely to result in the successful operation of school; whereas an authoritarian style of leadership is less likely to do so (Preedy, 1989).

An illustration of this is given by McTaggart (1990) from his own experience when the leadership of his school thought of developing the staff through involving them in decision making and full participation in the school formal activities which yielded 'bottom-up' style of discussing schools affairs. He states "....later this 'bottom-up' policy of determining staff meeting agenda proved far more successful".

Consequently, one of the most significant issues in this respect is the leaders' own perception of his role. There is evidence in the literature to show that school principals as leaders differ widely in their understanding of their role (Leithwood, 1992). In many cases school success or failure can be ascribed to this factor. For instance in the previous illustration, MacTaggart (1990) states "I see myself as a provider of options, ideas, resources, methods, etc; and helping advising and re-assuring staff as we progress.....". Apparently, this

kind of perception is much more likely to result in success. Basically, because it is far away from the autocratic models of leadership that have failed to release professional potential in teachers as reported by Day et al (1987).

However, the relevant literature offers what can be described as an ideal role that should be played by leaders towards teachers in order to support their professional learning. For example the acknowledgement of teachers ability to identify their needs and the ways they can resolve those needs should be the starting point of leaders. In their case study Sellars and Francis (1995) tried to involve teachers not only in identifying their own needs but also in identifying the role of the leader, which was of great impact on the eventual results of their work. This approach to staff development will necessarily lead to activate and encourage professional learning in a way that satisfies teachers and meet their requirements.

Further, Day et al (1987) maintain that "the responsibility of the managers must be to minimize constraints upon learning itself and indeed upon the motivation to learn". This statement actually summarises everything that can be said in this paper regarding teachers' professional learning. One of the major constraints upon teachers' professional learning that should be mentioned here is the constraint of time as clarified earlier. School leaders or managers must allow enough time for teachers to spend in the way they think is the most constructive way to learn something about their practices.

Additionally, with enough time allowed for teachers, the leader might encourage teachers to do some professional readings, to visit and observe other classrooms or to plan work cooperatively where teachers can learn from each other as stated by Francis (1991).

Above all, the leader in any school should be responsible for the quality of the relationships among his or her staff, they should provide all conditions possible to create and sustain good and healthy relations, otherwise, it will be difficult for professional learning to occur. The significance of relationships has already been addressed earlier.

EXTERNAL HELP

Looking at professional learning as the main source of teachers' professional growth does not necessarily preclude the possibility of getting help from outsiders. On the contrary, the literature is telling us that we should not assume that all teachers like to be self-directed. Further, Argyris and Schon (1976) argue that reflection-in-action which can be regarded as one of the

principal sources of professional learning "limits the possibilities of change". Therefore teachers need another source of learning to support or direct their knowledge. This source might be courses organized by outsiders for example.

Moreover, in many cases it is difficult for a person to see his or her own weaknesses; basically because people usually act according to their personal beliefs although these beliefs in some cases are unexamined which means they may be right or may be wrong. Accordingly it is good to listen to other people opinions about ones practice (Eraut, 1977). Other people in this case may be colleagues and may be outsiders.

Consequently, external help of any kind might be useful for teachers' professional learning. However, the way in which external help is introduced to teachers is the issue here. This help should not be introduced in a way that ignores teachers professionalism because such a way might result in teachers resistance especially because many teachers do not like to be seen as uncertain and weak in their professional knowledge (Schon, 1983).

However, the literature offers some example of how external help should be introduced. As mentioned earlier, teachers as practitioners must be the center of all activities intended to reinforce their professional learning. This means they should express their desire for getting help of any kind. This notion was expressed by one of the (DES) reports in the UK many years ago when it said "INSET is a voluntary professional activity which depends for its success upon the goodwill of teachers" (DES, 1978).

McNiff (1990) believes that teachers should only be encouraged to find out answers for questions about the problems of their immediate situations. In other words, external help should be restricted to show teachers the way they should go through only and not to go that way on behalf of them. In addition, the literature depicts that when teachers are ready they might exchange visits either in one school or between schools and they might invite consultants or experts into their classrooms (see for example Shostak, 1982; Francis,1991).

CONCLUSION

This paper is based on the assumption that supporting the natural professional growth of teachers via encouraging professional learning is one of the most effective approaches to ensure the continuous development of teachers as professionals. It is apparent from the presentation of the different sections of this paper that the idea of supporting teachers professional learning is far more likely to be accepted and supported by teachers themselves; mainly

because it considers teachers (practitioners) as the center of professional development and all moral and material resources should be employed to make this professional development possible through natural learning.

However, suggesting this approach does not necessarily mean that other approaches as offered in the literature are not useful. Rather, all those approaches can be incorporated into the concept of professional learning when teachers will be the only owner of professional development enterprise; they alone make decisions about when, where, how and who regarding their professional development.

Moreover, professional learning as perceived in this paper is the most systematic approach to professional development of teachers. This because the quality and quantity of learning will automatically be exactly as required and intended as long as the planner and the implementer are the same. Nevertheless, for this to happen, teachers should be well prepared in their pre-service lives so that they know what professional learning means and how it occurs.

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Internet and Multimedia as Teaching Aids of Oman's 21st Century

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ABSTRACT:

Teaching in the next millenium is going to be highly influenced by multi cultural and multi ethnic rationalization due to the effects of the information technology and multimedia developments. The incorporation of Computers and Internet in the schools and colleges is opening new spheres of cross culture understanding and curriculum evaluations. Developing countries education systems are now in a position to compare themselves with the standards of the other systems across the continent as they actually change. This comes with the new and innovative teaching aid, "Multimedia", which Internet aspires to achieve. The Web is now considered as the largest single source of information in comparison to any library in the world and its availability to all gives information accessibility unrivaled in history of mankind. The advent of student Internet Know-how will enable a new era of teaching methods, distribution of information and hence knowledge.

This paper intends to review the aspects of Internet that are pertinent to the educational system as one conducted in Oman and how such a technology can assist the education within the schools and technical colleges curricula.

Background

Information Technology has made it easy for academic institutions to compare their implemented education strategies with those implemented by their counterparts in other countries. The availability of dedicated web sites for curricula and education techniques have made this process as real time as possible, (Syllabus Wen, Curriculum in the web). The standard of education of high schools and colleges is required to be compatible with the international standards which themselves tend to evolve with time and technology. In most cases these changes in curriculum imply increase in teaching technology and hence efficiency (Jack Treuhaft 1995). By the same token, however, this requires incorporation of computer education at earlier stages of schooling.

The requirement and desire of many countries to achieve standards of education equivalent to the developed world standards of western countries certificate (O-level, A-level, GCSE etc) tend to neglect the computer literacy of the developed countries. It is evident that the middle class children of the developed countries tend to grow in computer aware surroundings and in most cases some of them would own or have access to a computer prior to their high school graduation. The college and university freshman is in most cases computer literate in comparison to students from the developing world of the same high school level.

Blind implementation of the western nations' post secondary curriculum tends to neglect the near zero level of computer knowledge of developing world high school students. Significant strides in the areas of computer hardware and software have made it possible and necessary to incorporate computer education at high school levels. The rationale of these implementations make sense even to the economics of the developing countries.

Computers

The recent increase in computer hardware sophistication has proportionally decreased the stringent requirements of their utilization. In turn this has resulted in further development of complex computer software, which could not become possible without this advancement in hardware. This was simultaneously coupled with significant reduction of the computer and computer peripheral pricing.

It's fortunate that these happened at out time and even more are is on the offering. Simultaneously, albeit unfortunate, that this rapid development has shocked and caught most of the educational institutions unprepared, or

scrambling for exploratory programs instead of carrying a major part of the core curriculum (Levin and Meister, 1985). The calls to computerize and change the style of education have the callers and the called confused. Should the computerization start at the nursery or at the college? Is the high school the right stage? Is the educational staff equipped with the necessary computer skills. The confusion was even more highlighted by the introduction of Internet.

At this point its not only important that the user should know how to use the computer in-front of him/her but also other computer across the continents and oceans. One is now demanded to be able to set his computer, to communicate, search and secure information from the estimated millions of computers connected in the Internet. The task can be seen as magnanimous and it would really be so should the computer software had not been as user friendly as they are today.

The user-friendly software has significantly reduced the learning curve of computer literacy. Years of previous computer experience and capabilities can now be taught in a matter of months. The information technology "masterpiece", Internet can be taught in just a few weeks. Equally for the computer literate, the Internet know-how can be assimilated in just few hours of demonstrations (International Training Institute 1997).

The IBM Personal computers open architecture had allowed computer capabilities and features to be modifiable and in other cases upgradeable. This in most cases has been complicated and painstaking for a non-technical computer user. This difficulty is now eradicated by automatic capabilities of the peripherals to configure and identify themselves to the main operating systems and hence the interfaced computer. Microsoft Windows 95 Plug and play capabilities is a good example of the simplified hardware modification and upgrading techniques.

With the present Local Area Network (LAN) capabilities the computer systems can even withstand the students misuse and willful disfiguration. Overall the present computers are more robust and ready for educational institutes use than ever before.

Market Training Requirements

Most of the developing countries market like their developed colleagues requires the high school leavers and college graduate to be fully computer literate. The need is performance based, as it has by now become evident that the utilization of computers increases efficiency and hence profitability of the

organization (reference). Introduction of Internet at work places has further amplified this need. Interpersonal communications are now expected to be electronically fast and delivery assured. Lack of knowledge on Information technology can put one at significant disadvantage to get and keep his/her employment. Educational Systems in developing countries have now to cater for these needs.

Oman Educational Needs

Oman requires that the educational standards of both high school and colleges be internationally recognized. This is mainly emphasized by the student's needs to be able to continue their education abroad if so required. As more high Schools and colleges have started to answer the educational needs of Omani community, the standards are now required to fulfill both the local market requirements as well as foreign educational institutes.

The majority of students, who complete Omani high school end up in the post secondary institutes, Educational institutes abroad or at work (See figure 1). There has been no study on their standing at work place or at the institutes abroad as far as their computing capabilities are concerned. However it very justifiable to expect that at beginning they do not fare well in comparison to their colleagues at western universities although they do tend to pick up the technical know-how over time. As the work places in Oman tends to increase automation and hence computerization the need for computer literacy will be significant and necessary to the Omanization policies (Al Naamany and Al Rumhy 1990).

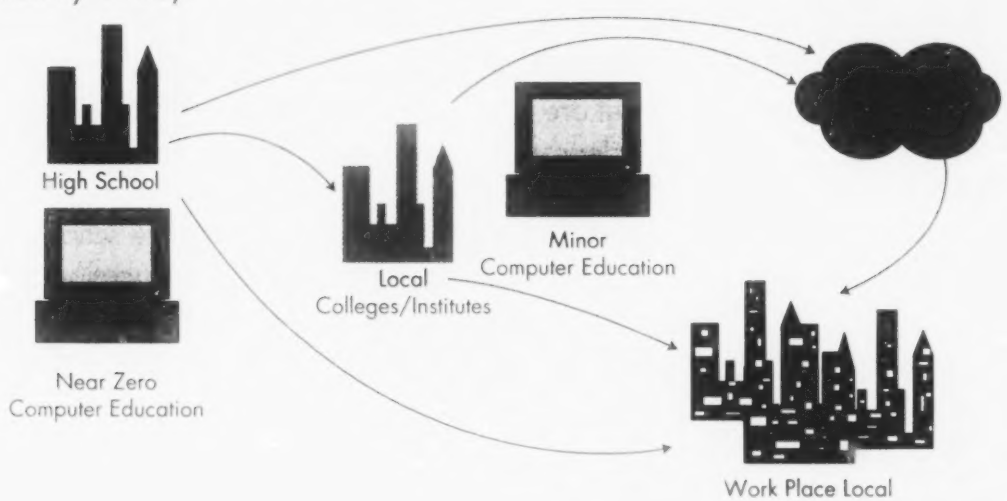

Figure 2. Omani high school leavers and their Computer Education

Qualify Assessments and International Standards

The need to ensure international standards and recognition have influenced the local colleges to develop affiliation with reputable international educational institutions (Modern College of Business and Science 1996) This affiliation ensures compatible standards and hence quality at the local institution. The international affiliated institution in this case would then ensure or guarantee the local graduates admission should they wish to continue their studies. Overall this partnership offers fast transfer of known-how and experience. In an other case an import of International University name and know-how was attempted (Caledonian College of Engineering 1997). In this case the student would remain in the same system as he transfers abroad for further studies within this University.

In both of the above-mentioned cases the institutions were recognizing the computer needs of the students completing high school and a significant amount of their resources were invested in computer labs and teaching. Some of these resources are utilized for interactive English courses.

Computer proficiency

In general, recently colleges and institutes have incorporated many new computer applications and tools in their curriculum. Despite the outward appearance of benefits the challenges to ensure that the benefits of such curriculum changes are achieved are enormous. Among those challenges is the conviction of those who ought to apply these changes. Most teachers tend to find little incentive to tackle technical and organizational conflicts and problems associated with technology.

Most of the complications that are coupled with the curriculum changes can be overcome by introducing a clear understanding of how the technology can improve learning and teaching techniques. Calfee (1991) points out that education reform requires the involvement of the classroom and the school as a whole. Whereby the students are to experience a new kind of education that raises their interest as well as develops intellectual effort and problem solving.

It is important that the incorporation of computers in training is done with an aim to raise the student's performance and not mere technology specific aims. As the technologies, software and hardware changes the problem solving techniques ought to enable the students to adapt to the new surroundings. It should be a learner's cognitive, affective, or behavioral performance, which should be enhanced during computer usage.

Facciola (1997) gives an example of a student who generates more and better ideas while using brainstorming software such as IdeaFisher, as those who would be experiencing an effect with technology. Similarly a good utilization of grammar and spell checking facilities in word processing resulting in more polished essays would also affect the students behavioral performance. Overall the students' improved performance while using computer tools, directly defines the effects of the computer training.

Computer Educational Strategy

Internet has made available several new uses of computers and hence benefits. The remote schools and institutes can now make good use of Internet as a means of communications, source of information and a channel of data exchange (see figure 2). What is still lagging is incorporation of these facilities to the students' study plan as part of their practical teaching. This introduction ought to be in both the high schools and the post-secondary educational institute.

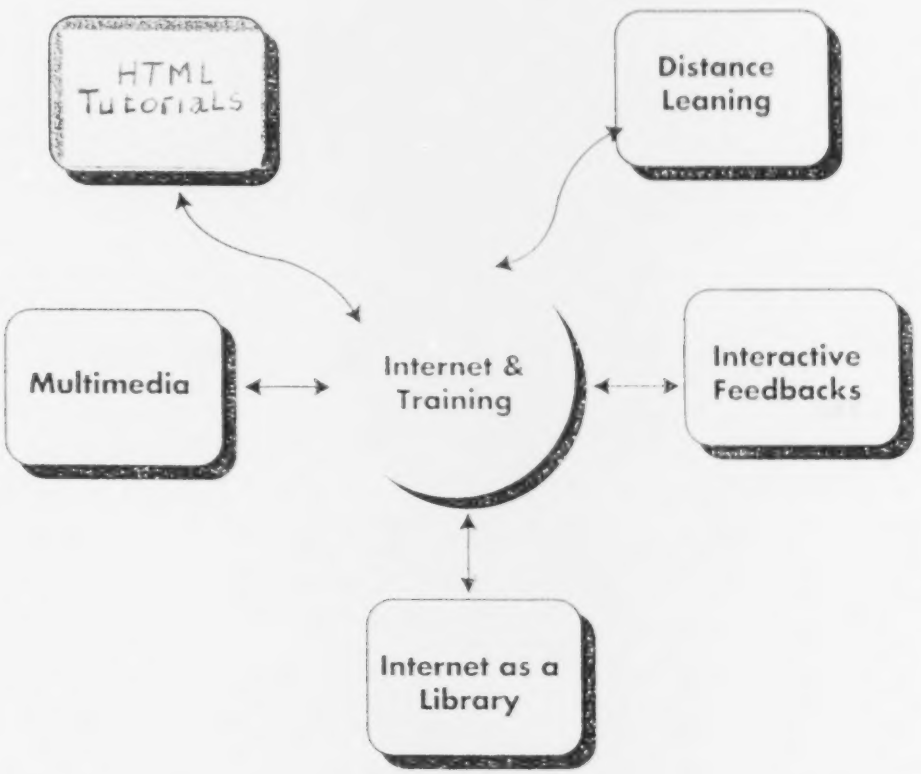

Figure 2. Possible Internet Technologies for incorporation to the educational curriculum

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The most outstanding issue in the introduction of computer education in high schools is the cost factor. With the majority of the high schools in the developing world, and also Oman, being under direct Government funding and management, any sudden changes in computerization would incur major budget and training by the sole contributor-the government. However this introduction could be done at stages and at one level at a time. With some of American states reaching a stage of saying "Unwired classroom is no longer an option" (David Strow 1997), the developing world should start to develop strategy not to be left so far behind.

Should computer classes be introduced at the late stages of the high schools then the post secondary institutes could start with the students at a faster and better level of computer uses.

Possible Implementation Scenarios

A variety of implementation of computer education can be suggested and reviewed. The following is a minor review of what is possible to be implemented in Oman with its present limited resources. These suggestions are based on the availability of technology and material to conduct such accomplishment.

Utilization of Hyper Text Marked-up Language Programming

As usual the last year of the high school introduces a challenge to the students to strive for position in the college of their choice. Hence to facilitate better learning the high school computer uses could be solely for tutorial purposes. Computers could be utilized to represent the taught materials in user-friendly multimedia themes. These packages could be developed locally using Hyper Text Marked-up Language (HTML).

At later stages the incorporation of the present Omani TV tutorials and teaching materials could be converted to the distance learning materials used in the computer networked classrooms.

The utilization of HTML programming is not limited to the tutorials and presentation of course materials but, could include stand-alone training modules and projects for the students. As the HTML documents can now be produced by mere simple editors the development of student home work and simple projects could be easily achieved. Similarly an Instructor can convert parts of his course into independent study and guide the students to information rather than being himself the direct provider (Alan Levin 1994).

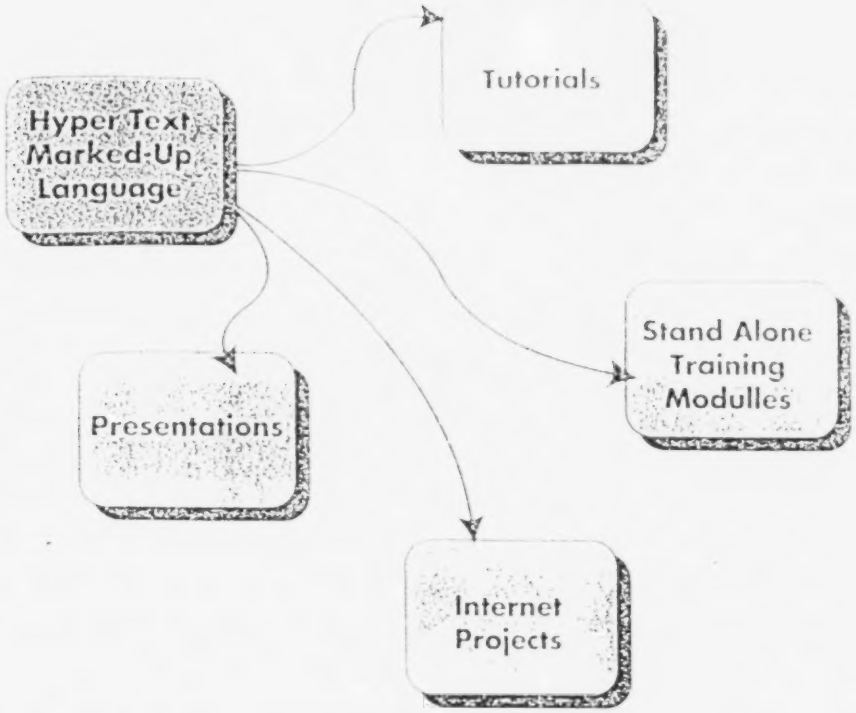

Figure 3. HTML as training tool

Distance Learning

The Arabian Gulf countries possess all necessary ingredients that would allow success of interactive distance learning. With highly dispersed population per area and availability of technical resources and funding it seems that allowing part distance learning and part centralized learning would suit this region best. This coupled with the need of some of the Arabian Gulf countries to have separate education for girls and boys which sets parallel image courses for the two groups makes it even economical to have one instructor lecturing simultaneously to the two groups. The fact that the instructor can interact with students by entertaining the questions of the two groups makes this a better alternative to the previously used closed circuit television.

At the same time the colleges that are forming an affiliation with other colleges abroad could utilize their affiliated institutions to compensate for staff and curriculum shortfall. This at the same time could bring about the quality assurance and necessary assured feeling that the local education system is reaching the levels of the international standards.

The Distance learning can now be technically Internet based. Present

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capabilities of some sites to propagate as TV channel to the registered clients such as Microsoft Windows 98 is to support the Wavephore and Wavetop software which will allow high data transmission rates. This in turn has made possible transmission of digital video images with good quality sound. Apart from this the advancement of the "chat" and HTML as presentation program allows the variety of training possibilities (See figure 4 below).

Judith Boettcher (1997) points out that distance learning can be uncomfortable for many faculty as some faculty are most comfortable when they can be "eyeball-to-eyeball" with their students and in some cases use hand waving at varying level of emotions, tones and enthusiasm to communicate their ideas and content. While the present video technologies can assist in bringing about the same closeness, inspiration, and interaction to distance learning.

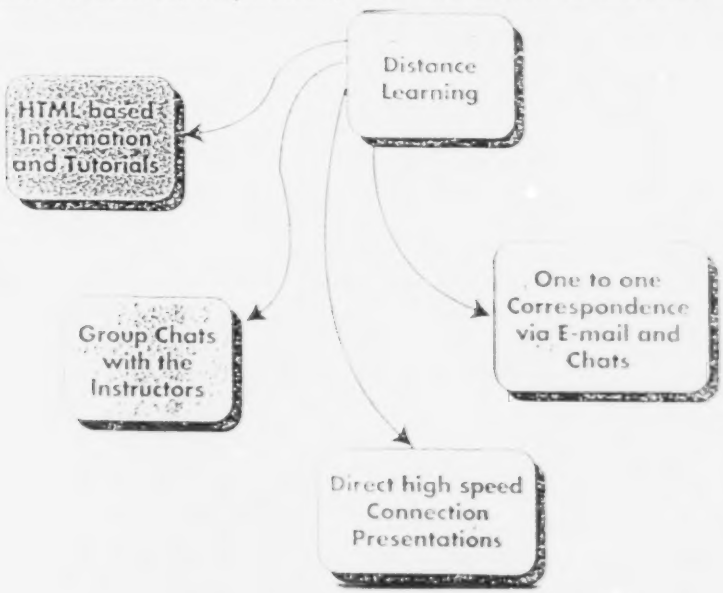
Distance Learning
HTML based Information and Tutorials
Group Chats with the Instructors
One to one Correspondence via E-mail and Chats
Direct high speed Connection Presentations

Figure 4. Distance learning scenario

The question of performance of students in a distance learning scenario in comparison to normal class is yet to be answered in practice (Moore 1989). Nelson 1985, points out, in his distance learning evaluation that on a two-way interactive television project in Iowa, that students in television classes performed equivalently to students in other classes taught by the same teacher. This at least suggests that the normal class quality is maintained. Apart from this, the distance learning and its Information technologies applications will indirectly prepare the students to the future Teleworking and Telecommuting i.e working away from work by the use of telematics (Al Habsy and Al Naamany, 1996)

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Internet as Library

The majority of the developing world schools are poorly equipped with well functioning library, if it exists at all. The availability of Internet connections could make it unnecessary to have any of these libraries at all. Most of the materials could be searched and be printed for later reading in a matter of minutes. Despite the question of the quality of the Internet material, the sheer size of the Internet Information overwhelms any reputable library and makes it the best alternative to the present libraries. Virtual Libraries (Internet Public Library)

An important reservation could be raised on the amount of Arabic information in Internet, which is still significantly low. This however can be expected to increase as more ministries of education, higher education and Middle Eastern companies embrace the Internet.

Conclusions

Special computer institutes presently address computer know-how demand at extra cost and time of their candidates. The students have to undergo, several months of intensive training to allow him/her to qualify as data enterer and other computer related positions. Should this training be incorporated in their high-school curriculum it would in turn enhance their academic capabilities at an early stage. This would indeed be the efficient way to use the meager resources of the developing countries.

The suggested implementation methods in this paper may not represent the best and the most economical techniques, however can they be considered as an initiative to encourage and possibly launch a discussion on this area. A proper study ought to be conducted to suggest the best value for money in terms of implementation.

There is no doubt that there has to be a nation wide training program to enable the high school instructors to be able to implement general Computer and Information Technology classes. The Sultan Qaboos University or other higher education Institutes could conduct the workshop labs and seminars in the country. An investigation/study is required to analyze the needs and the possible implementation methods of technology to the education system. In essence there is need for discussion on this issue by the ministry, industries and the educational institutes.

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Education and Development in the Sultanate of Oman

(Summary Paper)

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EDUCATION AND DEVELOPMENT

Part One: Introduction

1. The onset of the development process in Oman coincides with the beginning of the renaissance period which followed the accession of His Majesty Sultan Qaboos in 1970. Since his assumption of power, Oman has been transformed from a stagnant, conservative country into a modern state. The result of His Majesty's vision is that the people of Oman now enjoy extensive free health services and the availability of universal free education with almost 100% enrolment ratio.

2. Since 1970, Oman has achieved remarkable economic progress. Gross Domestic Product (GDP) increased from RO. 103 Million in 1970 to RO. 5288 million in 1996. Accordingly, GDP per capita grew rapidly during this period. The growth in GDP has been associated with a similar social development in services sectors in general and in those sectors related to human resources development such as education, health, housing and employment. Unlike most of the developing countries, economic and social development in Oman were both impressive.

3. The development strategy of the Sultanate adopted in 1975 has made it very clear that the well being of the Omani citizen is the ultimate objective of the development process. Consequently, government policies during the past twenty-five years were directed towards human resources development. Health and education and training are of course the backbone of any efforts in this area and are among the most important ingredients.

4. Experiences of the developed countries has shown that education is among the top factors which have greatly contributed to their advancement and

progress. Economic development and the growth of these economies during the past decades were based on their high quality education and the resultant advancement in science and technology which accompanied it. In fact one of the most important lessons learnt from the experience of the Southeast Asians and the high sustained growth of their economies is said to be their highly educated labour force.

Part Two: Population

The mutal interrelationship between population and development has been well recognized by the government of the Sultanate since the on-set of the renaissance led by His Majesty in 1970. Population size, growth rate and composition are important factors that occupy a central position in the development process. They represent on the one hand, the most important factors in determining the needs in terms of basic services such as health, and size of the economically active population and unemployment rate. On the other hand, they represent the most important factors upon which sustainable development is based.

Population Size and Composition

According to the final results of the 1993 Census, the Omani population totaled around 1.5 million. The average annual growth rate was 3.7% that is one of the highest rates among developing countries. This high population growth rate is solely attributed to the high fertility rate which was (6-9) children/woman. This fact coupled with other factors were the main reason behind the high percentage of children below 15 years of age totaling 52% of the total population. Such demographic structure is associated with numerous consequences such as:

a. High economic dependency ratio (in Oman one economically active person supports on average 6 dependents).

b. Low percentage of the economically active population.

c. Pressure on government to increasingly provide more social services in the fields of education, health care and recreational facilities.

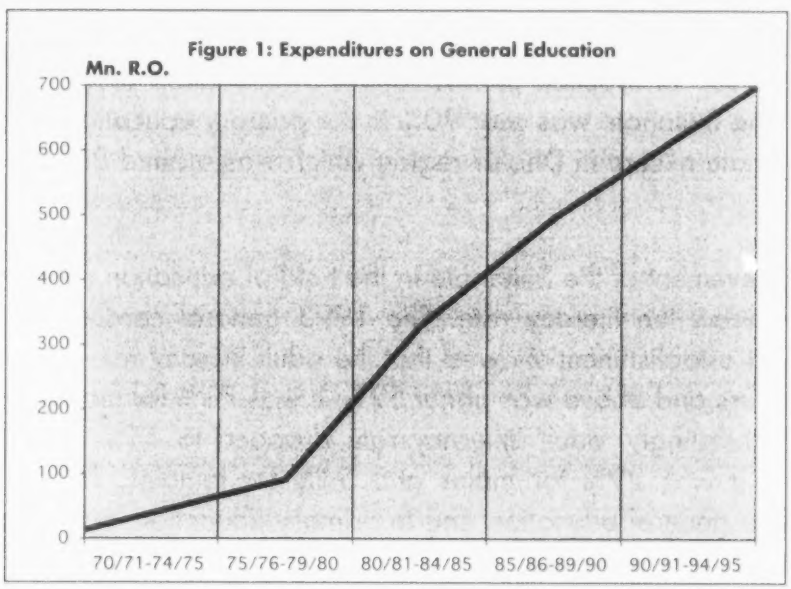
Part Three: Summary of the Achievements in Education during the Past Twenty-Five years

General education represents the cornerstone of education and the basis of human resources development. His Majesty's Government awareness of this fact has been the driving force for the remarkable achievement in this field.

It is very illustrative to note that the number of students at this level of education rose from just 909 male students in 1970 to over half a million in 1997/1998. (See Table 1 and Figures 1 and 2).

Table (1)
Development of Education

	74/75	79/80	84/85	89/90	94/95
1. Number of students in the general education	49229	94823	192854	323468	469849
Annual growth rate	–	14.0	15.3	10.9	10.8
% of Female	25.1	31.5	40.4	46.0	48.2
2. No of Schools	176	365	543	741	926
3. No of Teachers	2115	4082	8104	14123	21170
4. No. of Classes	1384	3157	6055	9835	14340
5. No. of Students/Teachers	23.3	23.2	23.8	22.9	22.2
6. No. of Students/Classes	35.6	30.0	31.9	32.9	32.8
7. Expenditures on General Education (Mn. R.O.)	16.1	91.6	330.0	497.1	696.4



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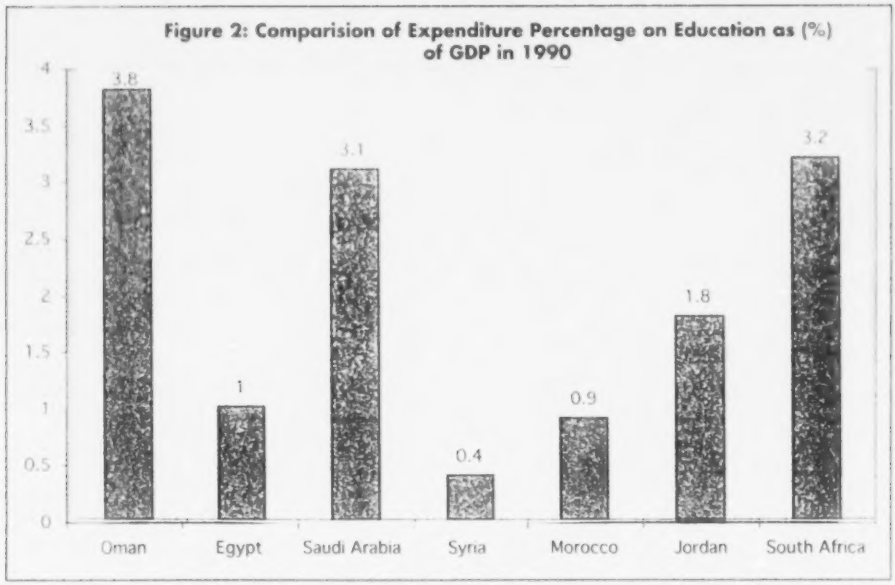


Female enrolment ratio currently stands at 48% of total enrolment. (Figure 3 on the next page).

The spread of schools in all regions of the Sultanate and the equal opportunities for females has improved the gross enrolment ratio at all education levels. (Figure 4 in the next page shows a comparison of Gross Enrolment Ratio between Oman and a group of countries). The ratio reached in 1997 about 92.3% for primary level for population in the age group 12-14 and 57.6% for secondary level for the age group 15-17. The enrolment ratio at the regional level are very close to the ratio at the national level thus exhibiting a fair distribution of investments in education among the different regions of the Sultanate was over 90% in the primary education for all regions of the Sultanate except in Dhofar region which was around 85%.

Literacy

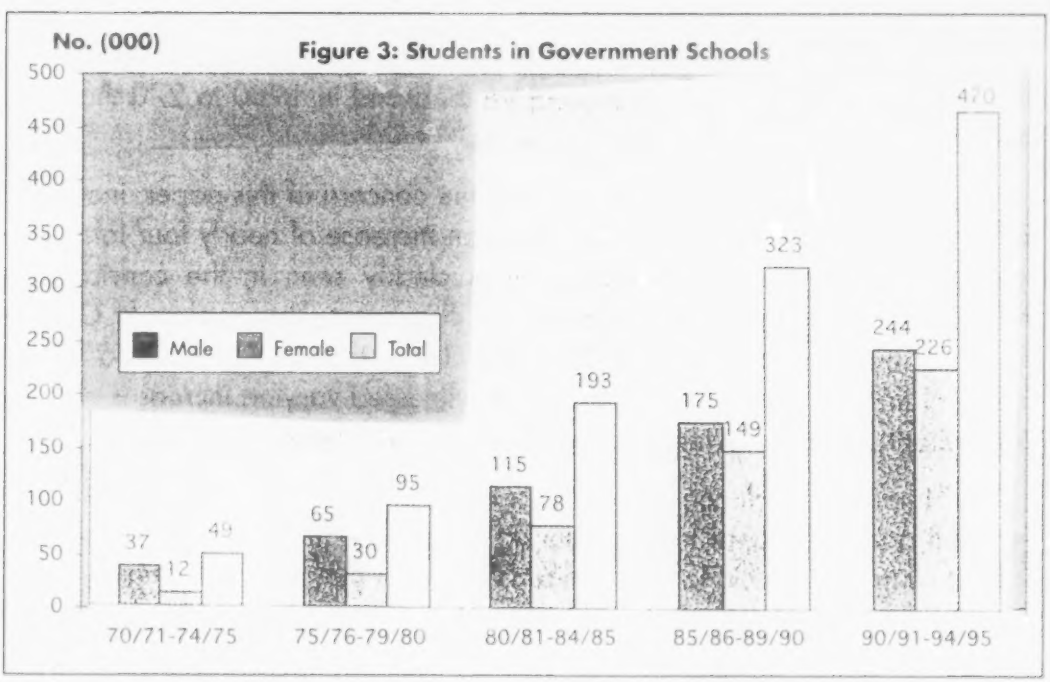
The achievement of the Sultanate in the field of education can best be seen if one considers the literacy rate. The 1993 general census of population, housing and establishment showed that the adult literacy rate among Omanis aged 15 years and above was about 59%; it was 71% for males and 46% for females. Accordingly, adult illiteracy rate dropped to 41% for total Omani population; it was 29% for males and 54% for females. The considerable expansion in general education and in primary education, particular together with the widespread of illiteracy eradication and adult education centres was the main reason behind these achievements.

The literacy rates was even as high as those prevailing in developed countries if we consider the young generation which reached the primary education age in or after 1970. The literacy rate among the age group 15-29 was about 87.5% i.e. the illiteracy rate was at the low level of 12.5%. Table No. 2 below shows the details:

Table (2)

Illiteracy Rate for Age Group (15-29), 1995

	Illiteracy Rate		
Age Group	Males	Females	Total
15-19	2.1	8.4	5.2
20-24	4.3	22.8	13.1
25-29	9.8	45.3	27.5
15-29	4.5	21.0	12.5



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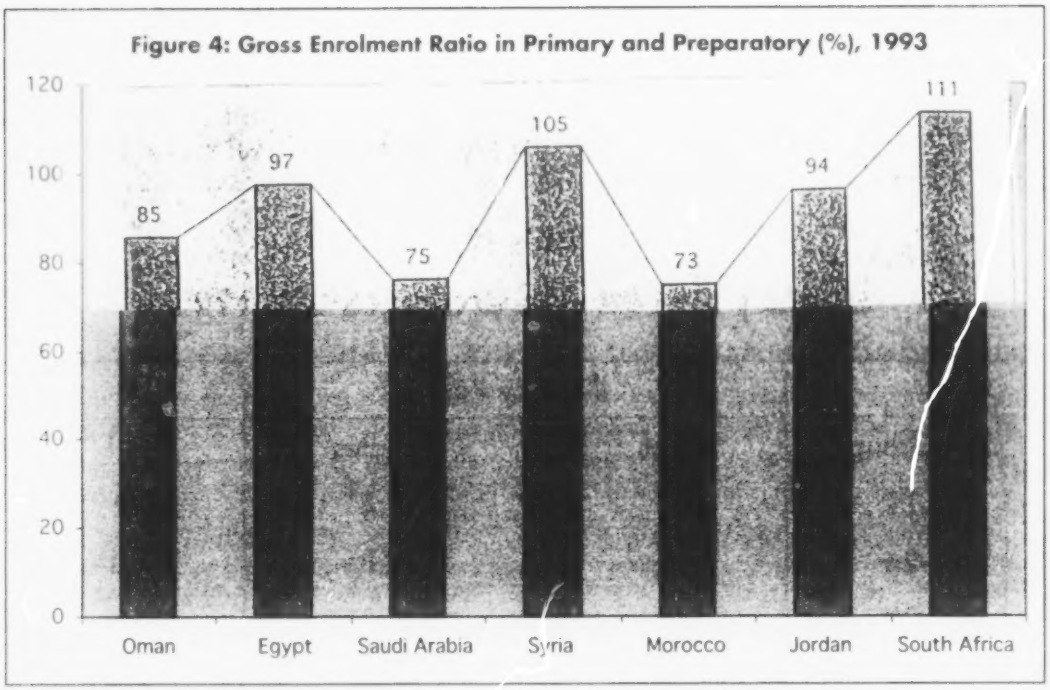

Education and Employment

Education is the means by which an individual can acquire skills to increase his/her employment opportunities to gain income. The expansion of the education for both males and females in the past was reflected in the increase of the Omani labour force in all sectors of the economy. Total Omani employees has increased from around 96 thousand in 1980 to 270 thousand in 1996; a three fold increase in 15 years.

Employment in the education, which is the concern of this paper, increased from 9,500 in 1980 to 36,777 in 1996, an increase of nearly four folds. The impact of the expansion of education is clearly seen in the considerable increase in the employment of Omanis in this sector. The number of Omanis increased by six folds i.e. from 3,300 in 1980 to 19,257 in 1996. Other sectors of the national economy have also witnessed varying increases with the government services having the largest employment figure.

The improved education levels, expansion in higher education and technical and vocational training during the past twenty-five years have their noticeable impact on the labour market. Omani employees in the public sector, for instance, experienced a considerable qualitative increase at the expense of jobs at the lower level of the civil services scale. (See Table 3 and Figure 5, next page)

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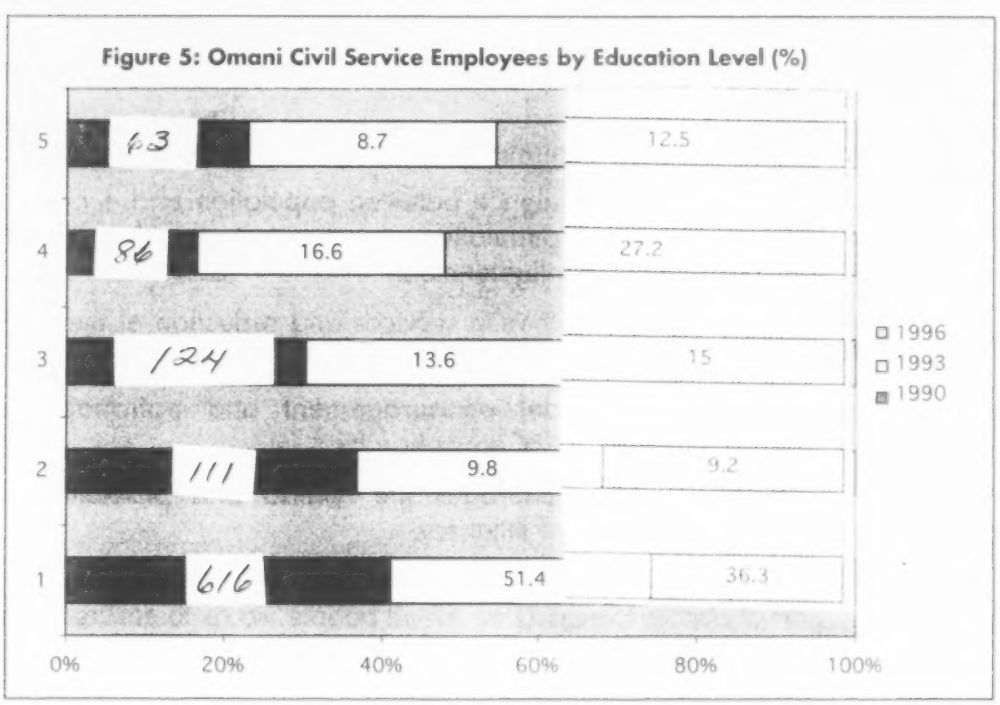
Table 3: Omani Civil Service Employees by Education Level

Educational Level		1990	1993	1996
1) **University**	No.	2763	4695	6605
(Specialized Works)	%	**6.3**	**8.7**	**12.5**
2) **Diploma**, Institutes and	No.	3779	8940	14403
Colleges (Technical Works)	%	**8.6**	**16.6**	**27.2**
3) **Secondary** (Skilled)	No.	5449	7326	7938
Office and Artision Works)	%	**12.4**	**13.6**	**15.0**
4) **Preparatory** (Semi Skilled	No.	4903	5305	4859
Office and Artision Works)	%	**11.1**	**9.8**	**9.2**
5) **Elementary** or below (Other Semi	No.	27130	27725	19233
Skilled or Non Skilled Works)	%	**61.6**	**51.4**	**36.3**
Total Educational	No.	44024	53991	53038
Status	%	**100.0**	**100.0**	**100.0**



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Part Four: Human Resources Development Strategy (Oman: 2020)

This part will discuss the vision for human resources and some of the challenges facing in this field then I will provide a view of the major policies and mechanisms that will be adopted in the field of education in order to achieve the approved strategy.

The vision for Human Resources Development is stated as follows:

To develop human resources and the capabilities of the Omani people to generate and manage technological changes efficiently, in addition to facing the continuously changing local and international conditions, in a way that ensures maintaining the Omani traditions and customs.

A. The Main Challenges Facing Human Resources Development:

Despite the significant improvement during the past two decades in the indicators relating to the Omani human resources development, there are still some challenges such as:

1. The increasing demands for basic services, such as health, education, housing, water and sewerage systems, resulting from the fact that the rate of population growth exceeds the growth rate of national income and government revenues.
2. The weakness and inadequacy of basic education to cope with the rapidly changing scientific and technological development.
3. The low level of productivity of labour resources.

B. The Dimensions of the Human Development Strategy for the Period (1996-2020):

The most important dimensions of the strategy are as follows:

a. *First Dimension:* To achieve a balance between population and economic growth by reducing the current population growth rate to less than 3% by 2020, through reasoning and enlightenment.

b. *Second Dimension:* Provision of health services and reduction of the rates of mortality and infectious diseases.

c. *Third Dimension:* Dissemination, encouragement and patronage of knowledge and the development of education by:

   1. Creating a climate that encourages the spread and promotion of knowledge and eradication of illiteracy.
   2. According priority to the spreading of basic education, upgrading, and the provision of access to education for all people, so as to ensure equal opportunities for all people. This will be done in an efficient and cost effective manner.

d. *Fourth Dimension:* Establishing a post-secondary and technical education system based on the provision of the main specialisations required by the national economy, together with the provision of the necessary facilities for carrying out applied research in the social or economic fields.

e. *Fifth Dimension:* Providing a system for technical education and vocational training that is capable of preparing labour to adapt to the needs of various specialisations and skills in the labour market, and the achievement of an income that conforms with performance and productivity.

f. *Sixth Dimension:* Creating employment opportunities for Omanis in public and private sectors, in addition to equipping them with training and qualifications that conform to labour market requirements.

C. Approved Policies and Mechanisms for Achieving the Vision for Human Resources Development:

a. *Major Policies Related to General Education:*

The policies and mechanisms related to general education were formulated within the framework of these stages. These policies and mechanisms are as follows:

1. Upgrading the level of basic education until it compares favouably with the levels in advanced countries.
2. To determine an appropriate form of secondary education that suits the requirements of the next stage, and ensures the graduation of students who are well prepared to join the labour market after training.
3. To improve the employment conditions of teachers so that the Ministry will be able to attract teachers of the highest calibre.
4. To strive to provide in-service training for educational staff. This will enable the upgrading of the level of educational performance, and professional efficiency through various courses, workshops and seminars.
5. Because of the difficulty of obtaining all the additional funds required by Ministry of Education for the continuity of education on the one hand, and upgrading its levels on the other, may require additional means. Citizens are to be encouraged to contribute gradually to educational expenses after the basic educational stage.
6. To approach specialised international organisations in order to ensure achievement of desired levels. These organisation will undertake periodic evaluation of educational standards in the Sultanate relative to the countries with higher educational standards. This practice is common in many of the industrial countries, where this system is used to measure

student standards in mathematics and science, against students in other countries at same level.

7. To encourage the private sector to assume a role in the education sector.

b. *Major Policies Related to Higher Education:*

1. To continue the provision of free education at Sultan Qaboos University.
2. To review the specialisation available at the University, so that priority to be given to the specialisations required by the national economy.
3. Allow affiliation to Sultan Qaboos University. This will have a positive impact in reducing pressures on educational institutions and the labour market.
4. Encouragement and motivation of the University Staff to conduct research and studies, and provide consultation services in all academic fields to all developmental sectors of the country.
5. Upgrading the scholarships policy and complementing the public role through bearing part of the costs of scholarship in order to enable the maximum number of students to complete their university study. This should be on condition that the proposed specialisation meets the requirements of the national economy.
6. To facilitate affiliation and distance learning to accredited universities in order to obtain basic university degrees or to enroll in postgraduates studies.
7. To allow the private sector to establish private colleges that award diplomas and higher diplomas, according to regulations and criteria currently being set by the Ministry of Higher Education.

Part Five: Conclusion

Any assessment of the Omani Development Process must conclude that this process has been successful by any standards. It is further characterised by its strength and capability for further development. This provides the opportunity for progress to even broader avenues of development and growth especially in the field of education. Moreover, there are good prospects of eliminating any difficulties and overcoming constraints in order to achieve the approved development strategy, particularly in the field of Human Resources Development.

TOPIC 2: TEACHER PROFESSIONALISM: SCHOOL AND COLLEGE COLLABORATION

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Introduction

The practicum component in teacher education has long been the focal point of discussion among teacher educators not only in their colleges, but also at numerous conferences on teacher education around the world. Despite any apparent weakness in this method of teacher training, most staff members at colleges of education are quick to defend it as a viable form of pre-service education for promoting the optimum development of student teachers not only in their teaching strategies, but also in their overall professional attitudes.

In 1996-1997, ways to strengthen the practicum became the main agenda item at meetings for all those involved in shaping the practice teaching component at the Teachers' College of Education in Rustaq, the largest teacher training institute in the Sultanate of Oman. It is an Arabic college for Omani female students offering a four year Bachelor of Education degree with a program consisting of a subject specialization component (55%), a professional component (25%), and a practicum component (20%). The practicum includes three main components: the serial or isolated practicum consisting of microteaching and field training, the block or continuous practicum, and the college-based practicum. The responsibility for the practicum involves three groups: the Educational Sciences Department; the Specialized Practicum Committee comprised of members of the Educational Sciences Department with subject specialization; and the Higher Practicum Committee with representatives from the college administration, Educational Sciences Department, and the local Ministry of Education. What was characteristic about the discussions at the meetings of all these groups was the emphasis that they placed on school and college collaboration as the ultimate

way to strengthen the practicum and ensure the professional growth of student teachers.

In Oman, like other countries, the responsibility of training student teachers is shared between the colleges' education departments and the schools. The underlying philosophy of the teacher training program in Oman is that the practicum must start at an early stage in the program. It begins in the first semester of the student's second year at the college and is allocated 20 percent of the total credit hours of the program, having a value of 26 credit hours which are spread over 6 semesters. The number of teaching hours for the student teacher increases over the semesters. The cooperative teachers, however, have had a very minor part in the practice teaching component of the teacher education program in contrast with those in other countries. They provide the lessons for students and observe the student teacher teaching but do not give any formal evaluation. The assessment of the student teacher's work is left entirely to the college supervisor who is frequently from an academic department rather than from the Educational Sciences Department. This responsibility taxes the college staff particularly in some subject areas in which there is a shortage of staff to supervise students in a particular specialization.

To ensure the success of the practicum, the three groups believed that there must be more collaboration between the college and the cooperative teaching schools. This collaboration would benefit not only the student teachers but also the staff at both the college and the school, and the level of professionalism would be enhanced with college and school staff sharing ideas and working towards a common goal of providing the best teaching and learning experience for student teachers. To determine the success of the practicum at the Teachers' College of Education in Rustaq, all three groups supported the idea that a research study should be undertaken to evaluate the practicum component and to determine ways to strengthen school and college collaboration and enhance the professional qualities of student teachers and all those involved in the practicum.

The interest in evaluating the practicum to determine its value in the teacher training process is not unique to the Teachers' College of Education in Rustaq. The topic of the value of the practicum has been a major area of concern in the Gulf States for many years. There have been several studies to evaluate the program, the role of the cooperative teacher, and the educational and academic programs. The influence of the principal and the cooperative teacher on the student teacher's development and the value of the education courses in

preparation for the practicum have been under review for many years in the Gulf area. In addition, the number of lessons that the student is required to teach in preparation for a future teaching position is a topic of constant deliberation.

The findings in the studies done in the Gulf States reinforced the views of the staff at Rustaq on the importance of college and school collaboration with the practicum component. For instance, the Al Khuli study of 1975 involving graduate students from Al Riyad University addressed such issues as the importance of the cooperative teacher, the relevance of the practicum for the student's future career, and the number of lessons required in the practicum. The findings of the study showed:

- 66 percent of the student teachers preferred to be supervised by one teacher in the practicum;
- 69 percent of the student teachers mentioned that there was a strong relationship between the theoretical content of the methods of teaching and the practical application in the practicum;
- 73 percent of the student teachers said that the practicum was a positive influence on their future work as teachers;.
- 48 percent of the student teachers recorded that the number of lessons that they had taught was sufficient, while 52 percent of them thought that it was not.

In addition to assessing the importance of the practicum for teaching preparation in general, colleges of education in the Gulf States looked critically at the value of the academic and educational courses, as well as microteaching in serving the needs of the students in their teacher training. A study by Al Jaher (1984), involving 67 student teachers at the College of Education at King Su'd University indicated that:

- 17 percent of the student teachers mentioned that they received adequate academic preparation, while 46 percent thought that it was weak, and 37 percent indicated that it was inadequate.
- 42 percent of the student teachers responded that they had weak educational preparation, while 32 percent said that it was inadequate, and 12 percent indicated that it was fair..

The Al Hariqi Study in 1989 investigated the strength and weaknesses of the practicum at the College of Education at King Faisal University. The sample included 164 subjects: 50 male students; 61 female students; 13 school

principals; 9 co-operative teachers; and 31 educational supervisors. The findings of the study showed the following:

- 68 percent of the student teachers (male and female) felt that the number of lessons related to the practicum were insufficient;
- 65 percent of the male student teachers and 51 percent of the female student teachers reported that their academic and educational preparation was inadequate for achieving the goals of the practicum;
- 41 percent of male student teachers and 54 percent of female students found that the preparation program did not help in achieving the goals of the practicum;
- 66 percent of male student teachers and 54 percent of female student teachers emphasized the importance of the role of the cooperative teacher in the practicum.

Of particular interest to the staff at Rustaq was the study by Awad and Riface in 1989 conducted at Al Korum/ Al Khuware Intermediate College in the Sultanate of Oman. Some results of the study showed that there was no need for the cooperative teacher to be with the student teacher in the classroom.

With a knowledge of these studies done in some of the Gulf States, the Educational Sciences Department at the Teachers' College in Rustaq, with the support of the two practicum committees, decided to evaluate the practicum as well as to determine ways to strengthen school and college collaboration in teacher education and enhance the professional qualities of all involved in the practicum

Problem of the Study

The aim of the study undertaken at Rustaq Teachers' College of Education in the Sultanate of Oman was to evaluate the practicum as a basic component of the teacher training program from the point of view of the cooperative school principal, cooperative teacher, college supervisor, and student teacher to determine ways to strengthen school and college collaboration in teacher training and promote the professional qualities of student teachers, principals, and teacher educators.

This study was designed to obtain answers to the following questions:

Question 1. What is the role of the cooperative school principal in

implementing the practicum in her school?

Question 2. What is the cooperative teacher's role in implementing the practicum in her schools?

Question 2.1. Is there a significant difference in the cooperative teachers' role in implementing the practicum in their schools as a result of their specialization?

Question 3. What are the points of view of the college staff in implementing the practicum in the cooperative schools?

Question 3.1. On each and all items in Questionnaire Number 4, is there a significant difference in the points of view of college staff, according to their specialization, in implementing the practicum in the cooperative schools?

Question 4. What are the points of view of student teachers in participating in the practicum?

Question 4.1. On each and all items of Questionnaire Number 3, are there significant differences in the points of view of student teachers, according to their specialization, in participating in the practicum?

Question 4.2. On each and all items in Questionnaire Number 3, are there any significant differences in the points of view of student teachers, according to their academic level, in participating in the practicum?

Question 4.3. On each and every item in Questionnaire Number 3, are there significant differences in the points of view of student teachers, according to their specialization and academic level, in participating in the practicum?

Operational Definitions

- Principals' Role in Implementing the Practicum: The score which represents their responses on Questionnaire Number 1 for evaluating the practicum.
- Cooperative Teachers' Role in Implementing the Practicum: The score which represents their responses on Questionnaire Number 2
- College Staff's Points of View in Implementing the Practicum: The score which represents their responses on Questionnaire Number 4.

- Student Teachers' Points of View in Participating in the Practicum: The score which represents their responses on Questionnaire Number 3 for evaluating the practicum.
- Student Teacher Specialization: A student teacher enrolled in one of the following specializations: Arabic Language, Islamic Studies, Geography/History, Physics/Chemistry, Mathematics/Physics, and Mathematics/Computer Science.
- Academic Level: The academic year, either second year or third year, in which the student teacher is enrolled.

Methodology, Population, and Sampling

The sample of the study consisted of four subsamples: principals of cooperative schools, cooperative teachers, college supervisors, and second- and third-year student teachers enrolled in the second semester of the 1996-1997 academic year. There were 16 cooperative schools associated with the college in implementing the isolated and continuous practicum components of the teacher training program. Accordingly, 16 principals from these schools participated in the study. There were 153 cooperative teachers from all specializations involved in the study. A total of 36 college staff were chosen from all specializations. The subsamples of principals, cooperative teachers, and college staff were universal samples of their populations. From a population of 606 student teachers, with 362 from the second year and 244 from the third year, 170 student teachers were randomly selected for the study. The following table shows the distribution of the students according to their year and specializations.

Table Number 1
Distribution of Student Teachers According to Their Academic Year and Specialization

Specialization	Second Year	Third Year	Total
Arabic Language	26	15	41
Physics/Chemistry	10	17	27
Mathematics	30	17	47
Geography/History	11	16	27
Islamic Studies	16	12	28
Total	93	77	170

Data Collection

Data was collected through the administering of 4 measurement instruments developed by three researchers:

- Cooperative School Principals' Questionnaire Number 1;
- College Staff's Questionnaire Number 2;
- Student Teachers' Questionnaire Number 3;
- Cooperative Teachers' Questionnaire Number 4.

These questionnaires included from 13 to 17 items to which responses were made on a 6-point scale from "strongly agree" to "strongly disagree". Their content validity was checked by twelve judges and against a review of the relevant literature. Cronbach's coefficient alpha formula was applied in estimating the internal consistency of the four questionnaires. In the trial run, alpha coefficients were .68, .85, .78, and .83 for Questionnaires 1,2,3, and 4 respectively.

Procedures of the Study

The procedures of the study were as follows:

1. The measurement instruments of the study were developed.
2. The population and the subsamples of the study were identified.
3. The instruments of the study were applied.
4. A trial run of the data was made.
5. The data was analyzed in the Educational Research Centre of Sultan Qaboos University by using Statistical Package for the Social Sciences.
6. The results were discussed and recommendations made.

Design of the Study

The design of the study included the following independent variables:

- the cooperative teachers' specializations;
- the college staff's specializations;
- the student teachers' specializations and academic levels.

The dependent variables were their responses on Questionnaires 2,3, and 4. Percentage, means, and standard deviations were used to describe the results of the study. One-way and two-way analysis of variance were followed to test the hypothesis $\alpha = .05$.

Presentation of the Findings

This study was designed to answer four major questions and five minor ones related to the data gathered from the four questionnaires which evaluated the practicum from the points of view of cooperative school principals, cooperative teachers, college staff, and second- and third-year student teachers. Percentages, means, and standard deviations were used to describe the subsamples' responses on the four questionnaires. One-way and two-way analysis of variance were used as well to test some questions. The findings were as follows:

1. Findings Related to Question Number 1, "What is the role of the cooperative school principal in implementing the practicum in her school?"

Table Number 2 indicates that the role of the school principals in implementing the isolated and continuous practicum program was effective. The means for their responses on the items in the questionnaire were between 4.56-6. These means were above the theoretical mean of 3.5. The table shows that the school principals' responses were approximately equal in their variances which grouped between 0.0-1.26

2. The Findings Related to the Main Question Number 2, "What is the cooperative teachers role in implementing the practicum in their schools?" and the Minor Question, "Are there significant differences in the cooperative teachers' role, according to their specialization, in implementing the practicum in their schools?"

Table Number 3 shows that the cooperative teachers' role in implementing both the isolated and continuous practicum was effective. The means for the responses on all items in the Questionnaire Number 4 were between 4.45 and 5.25. These were above the theoretical mean of 3.5. The same table shows that the cooperative teachers' responses were approximately equal in their variances which were between 0.56 and 1.52.

Table Number 4 which includes means and standard deviations of cooperative teachers according to their specialization shows that the means of all specializations were above the theoretical mean of 3.5: Arabic Language,

4.84-5.61; Islamic Studies, 4.58-5.50; Geography/History, 4.10-5.31; Physics/Chemistry, 4.15-5.25; and Mathematics/Computers/Physics, 4.24-5.41. The standard deviations for all specializations were between 0.50 and 1.77. To determine if there were significant differences in the responses of the cooperative teachers, according to their specialization, on each and all items in Questionnaire 4, one-way analysis of variance was used. Table Number 5 indicates that there were significant differences ($\alpha = .05$) on items 5,9, and 11. The application of Sheffe's method for multiple comparisons, however, indicated that there was no significant difference ($\alpha = .05$) between the means of two specializations for these items. One-way analysis of variance was used to test the significant differences among the specializations on all items in Questionnaire Number 4. Table Number 6 shows that there were no significant differences ($\alpha=.05$) owing to the specialization of the cooperative teacher.

3. The Findings Related to the Main Question Number 3, "What are the points of view of the college staff in implementing the practicum in the cooperative schools?", and the Minor Question, "On each and all items in Questionnaire Number 2, is there a significant difference in the points of view of college staff, according to their specialization, in implementing the practicum in the cooperative schools?"

Table Number 7 shows that the college staff's point of view in implementing the isolated and continuous practicum was mediate efficiency whereby the means for their responses on all items in Questionnaire Number 2 were grouped between 3.5 and 5.44 except in items 7 and 10 for which their means were 3.08 and 3.22 respectively. The same table shows that the college staff's responses were approximately equal in their variances which ranged from 0.81 to 1.76.

Table Number 8 which includes means and standard deviations of every college staff's specialization on each item in Questionnaire Number 2 shows that the means of all specializations except the Educational Sciences' subsample were less than the theoretical mean (3.5) on some items, while on other items they were above the theoretical mean. These means ranged as follows: Arabic Language, 2.17-5.67; Islamic Studies, 1.00-5.00; Geography/History, 3.17-5.33; Physics/Chemistry, 2.80-5,00; and Mathematics/Computer/Physics, 2.25-5.50; and Educational Sciences, 3.63-5.57.

To determine if there were significant differences in the college staff's responses on each and all items in Questionnaire Number 2, one-way analysis

of variance was used. Table Number 9 indicates that there were significant differences (α = .05) on all items except item 4. The use of Sheffe's method for multiple comparisons indicated that no two groups were significantly different at the .05 level. One-way analysis of variance was used to test the significant differences among the means of the specializations on all items in Questionnaire Number 2. Table Number 10 shows that there were no significant differences (α = .05) owing to the specialization of the college staff.

4. The Findings Related to the Main Question Number 4, "What are the points of view of student teachers in participating in the practicum?" and Minor Questions:

4.1: On each and all items of Questionnaire Number 3, are there significant differences in the points of view of student teachers, according to their specialization, in participating in the practicum?

4.2: On each and all items of Questionnaire Number 3, are there significant differences in the points of view of student teachers, according to their academic level, in participating in the practicum?

4.3: On each and all items are there significant differences in the points of view of student teachers, according to the interaction between their specialization and academic level, in participating in the practicum?

Table Number 11 shows that the student teachers' points of view in participating in the isolated and continuous practicum were above the theoretical mean of 3.5. The means for their responses on all items on Questionnaire Number 3 ranged from 3.72 to 5.4 except for items 2 and 3 for which the means were 3.17 and 3.05 respectively. The table shows that there was a similarity in their responses as the standard deviations ranged from .88 to 1.79.

Table Number 12, which includes for each item the means and standard deviations of every student teachers' specialization, shows that the means for all specializations, except Physics/Chemistry, were less than the theoretical mean (3.5) on some items, while on other items they were higher. The means ranged as follow: Arabic Language,3.02-5.50; Islamic Studies,3.07-5.50; Geography/History, 2.63-5.70; Physics/Chemistry, 3.54-5.70; and Mathematics/Computer/Physics, 2.62-5.32.

To determine if there were significant differences in the means of the responses to each item in Questionnaire Number 3 according to the student teachers' specializations, academic levels, and interaction between them, two-

way analysis of variance was used. Table Number 13 indicates that there were no significant differences (α = .05) owing to their specializations except on items 3,4,5,6,14,16. There were no significant differences according to their academic level except on items 6,11,14, and 15. As well, there were no significant differences in the responses on each item owing to the interaction between the specialization and academic level except on item 5. The use of Sheffe's method for multiple comparisons indicates that no two groups were significantly different at the .05 level on items 3,6,14, and 16. Significantly different pairs of groups were significantly different at the .05 level for item 4 in favour of the Arabic Language group. With all groups in the same direction, there was no significant difference in item 10 between Physics/Chemistry and Geography/History.

Table 13 also shows that there were significant differences (α = .05) related to the academic level on items 6,11,14, and 15 for students in the second year, but no significant differences according to the academic level on the other items. According to the interaction between specializations and academic level, there was no significant interaction (α = .05) except on item 5 in Questionnaire Number 3.

Two-way analysis of variance was used to test the difference in the means of the responses by student teachers owing to their specialization, academic year, and the interaction between them on all items on Questionnaire Number 3. Table Number 14 indicates that there were no significant differences (α = .05) owing to specialization (F calculated 3.51), academic year (F calculated 1.24), and the interaction between them (F calculated 1.24)

Discussion of the Findings

The points of view of school principals, cooperative teachers, college staff, and student teachers in implementing or participating in the practicum were the topics of the study. Four questionnaires for evaluating the practicum were used by the subsamples. The data were collected and analyzed. The findings of the study showed the following:

1. According to the cooperative schools' principals, they were effective in their role in implementing the practicum. Their effectiveness may be attributed to three meetings which were held by the college specifically for the principals. Participants included the General Director of Education for the area, along with the college administration, and members of the college's Educational Sciences Department. The meetings focused on the significance, goals, concepts,

components, and activities of the practicum. The importance of the principals in implementing the isolated and continuous practicum was emphasized.

2. According to the points of view of the cooperative teachers from all specializations, they were effective in implementing the practicum. Meetings organized by the college with school principals and cooperative teachers may have helped the cooperative teachers to be effective in their role, since these meetings included discussions on the practicum program including such topics as goals, concepts, components, activities and importance. In addition , the collaborative spirit generated among the college supervisors and the cooperative teachers may have contributed to the effectiveness of the cooperative teachers in implementing the practicum in their schools.

3. Despite the significant "F" of some items in Questionnaire Number 4, no two groups were significantly different at the .05 level on each and all items in the questionnaire owing to the specializations of the cooperative teachers. These findings may be the result of a paper developed by the college's Educational Sciences Department on the role of the cooperative teacher regardless of their specialization.

4. The college staff believed that implementing the practicum at the cooperative schools was moderately effective. The means of most of the items were concentrated around the theoretical mean regardless of specialization. When the specializations of the college staff were taken into consideration, the means for items 7 and 10 were less than the theoretical mean except for the Educational Sciences Department. Researchers believe that this finding may have occurred because the majority of the college staff lack a background in Educational Sciences. On the other items, the means of all specializations were higher than the theoretical mean.. College staff from all academic specializations except Educational Sciences recommended that the practicum begin in the fifth semester, which is the beginning of the third academic year. There was a strong feeling that the second-year students did not show a mastery of the school curriculum in their practice teaching. In addition, many college supervisors felt that it was too demanding to observe and evaluate four student teachers in a day. By postponing the practicum to the third year, the work load for the college supervisor would be less.

The findings showed that the mean for Educational Sciences in implementing the practicum was higher than that of other specializations. The understanding of the goals, concepts, components , and competencies of the

practicum by those with a specialization in Educational Sciences, along with their experience in teacher training may account for this result.

5. There was no significant difference (α = .05) between the means of all specializations on each and all items. Workshops specifically designed for those in the academic departments along with discussions on supporting print materials on such topics as the role of the college supervisor may account for this finding. These activities may have helped in establishing a broader understanding of the concepts in the practicum and its function in preparing student teachers.

6. The student teachers' points of view in participating in the practicum were higher than the theoretical mean, regardless of their specialization and academic year. At the same time, the homogeneity of their responses was apparent. The means of all specializations were below the theoretical mean on items 2 and 3, except for those of the Physics/Chemistry specialization. This difference in the findings may be a result of the smaller number of Physics/Chemistry student teachers in the cooperative schools. Their numbers ranged from 6 to 8, while the number of students in the other specializations ranged from 8 to 15.

7. On all items, there were no significant differences (α = .05) in the points of view of student teachers, regardless of their specialization, in participating in the practicum except in items 4 and 5 for Geography/History and Physics/Chemistry.

Researchers believe that the non significant differences which exist among the specializations may be due to:

- the emphasis in the program that each student teacher should teach a lesson, observe a lesson, and share in the cooperative school's activities during the practicum;
- the good relationships that were established between the cooperative teacher and the student teacher;
- the college staff's proficient supervision in the practicum;
- the effective participation of the student teachers in workshops and microteaching;;
- the advanced planning and programming of the practicum.

The significant difference in the responses among specializations,

particularly for Geography/History, to item 4 which states that the participation of the student teacher in the isolated and continuous practicum enhanced her academic and educational preparation may be owing to the high number of academic and education staff with a specialization in Geography/History. The difference in the responses to item 5 for the Physics/Chemistry specialization may be attributed to the small number of Physics/Chemistry student teachers in the cooperative schools.

8. There were significant differences (α = .05) on items 6,11,14,and 15 especially for the second- year students, while there were no significant differences on the other items owing to the student teachers' academic levels. This finding may be the result of the enthusiasm of the second-year students towards practice teaching, applying the knowledge and skills that they acquire from their methodology course in a re Al life situation, and seeing the links with their course and the school curriculum. The second-year student who is in the beginning stage of her practice teaching program needs the assistance of an experienced cooperative teacher who has an understanding of the teaching/learning process. The third-year student, however, tends to have more confidence in herself in general.

9. There were no significant differences (α = .05) on the items as a whole owing to the student teachers' specializations, academic level, and the interaction between them. This finding may be the result of the non significant differences attributed to the student teacher's specialization, academic level, or the interaction between them on each item separately.

Recommendations

After a review and discussion of the findings, the researchers made the following recommendations:

1. Principals and cooperative teachers should share in the evaluation of student teachers in the practicum..
2. The college should provide seminars and workshops on evaluation to assist principal and cooperative teachers in being effective in this new role.
3. Periodic joint meetings should be held with college staff from each of the specializations and specialists in curriculum and methodology to focus on the goals, components, and essential competencies of the practicum, especially the necessary elements of a lesson plan, and the items included on the evaluation card.
4. A special workshop on evaluation should be provided for all college staff

who are involved in the practicum. Such a workshop should include videotapes of students teaching to assist the staff in reaching agreement on standards of evaluation.

5. A sufficient number of instructors with a specialization in curriculum and methodology should be provided for all departments.
6. The college academic courses should include a link with the school curriculum, while educational courses should focus on the application of important concepts.
7. The size of the student teachers' groups for practice teaching in the cooperative schools should be no more than eight students.
8. A college supervisor should have the same group of student teachers throughout the isolated practicum.
9. It is preferable that the academic subject specialists teach the mastery content and language skills competencies.
10. The college should determine ways to promote more effective communication between the college and the school.
11. These recommendations as result of the study should be implemented as soon as possible in order to improve the practicum component.
12. Pre-service seminars should be offered to student teachers to familiarize them with the changes in the practicum component as a result of the study.
13. An evaluation plan should be developed to evaluate any changes made in the practicum as a result of the study.
14. Representatives from the subsamples involved in the first study should be involved in evaluating the changes made in the practicum as a result of the study.

Summary

The study has shown the importance of the principals and cooperative teachers becoming more actively involved in the practicum. The involvement of the cooperative teacher in the evaluation process will help to lessen the supervision load of college staff. The principals will enrich the practicum program by giving leadership to their staff on how to provide the best practice teaching environment for the student teachers. Their involvement in the evaluation process may be limited to assessing the student teachers' participation in and assistance with general school procedures and activities.

There will be a need, however, to support the principals and cooperative teachers in their new role with appropriate workshops on evaluation in order to avoid any criticism of their work and to ensure that their evaluation standards are in keeping with those of the college.

The willingness on the part of college supervisors as well as principals and cooperative teachers to participate in college seminars on the practicum augurs well for school and college collaboration. The ongoing need for joint meetings and in-service seminars for college and school representatives to discuss practicum issues and learn new strategies to improve the practice teaching component will help to strengthen the practicum and in turn promote and enhance the professional qualities of all involved in it. Not only will the staff at the college and schools benefit from such professional activities, but also the student teachers. They will witness role models striving for excellence in the practice teaching program, a process that will help to give them new insight s into the importance of the practicum in their teacher training experience as well as motivate them to adopt such professional behaviour.

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Table Number 2

Percentage, Means, and Standard Deviations of Principals' Responses on the Items on Questionnaire Number 1 of the Practicum Evaluation.

No.	Items	Percentages of Responses to Each Item								
		Strongly Agree (6)	Agree (5)	Tend to Agree (4)	Tend to Disagree (3)	Disagree (2)	Strongly Disagree (1)	Mean of Each Item (x)	Standard Deviation (sd)	Frequency (n)
1	The Necessary procedures were followed according to the educational administration to ensure the success of the practicum.	31.3	68.8	0	0	0	0	5.31	0.48	16
2	My school provided a program with necessary guidelines to help student teachers become positive members in the school.	62.5	25.0	12.5	0	0	0	5.5	0.73	16
3	I met periodically with the student teachers.	31.3	56.3	12.5	0	0	0	5.19	0.66	16
4	I coordinated periodically with the college supervisor to ensure the success of the practicum.	37.5	50.0	12.5	0	0	0	5.25	0.68	16
5	I provided the student teachers with a special program to help them participate in school activities after they had finished their classroom lesson.	18.8	50.0	18.8	6.3	0	6.3	4.63	1.26	16
6	Student teachers completed all activities and assignments during the school daily program.	6.3	43.8	50.0	0	0	0	4.56	0.63	16
7	The school provided at least one lesson for every student teacher daily.	68.8	31.3	0	0	0	0	5.69	0.63	16
8	The student teachers completed all assignments given to them.	31.3	50.0	12.5	6.3	0	0	5.06	0.85	16
9	The importance of the practicum motivated me to ensure the success of the practicum in my school.	62.5	31.3	6.3	0	0	0	5.56	0.63	16
10	I provided the school staff with clear written instructions for receiving student teachers.	81.3	18.8	0	0	0	0	5.81	0.40	16
11	I was interested in attending all the seminars at the college about the cooperative teacher and the practicum program.	100	0	0	0	0	0	6	0.0	16
12	The college scheduling of recording students names and their attendance was suitable.	25.0	43.8	18.8	12.5	0	0	4.81	0.98	16
13	I was informed of the students¢ names within a suitable time.	43.8	18.8	37.5	0	0	0	5.06	0.93	16
14	The communications between my school and the college was suitable.	50.0	37.5	6.3	6.3	0	0	5.31	0.87	16
15	I agree that the practicum will lead to a student becoming a good teacher.	50.0	31.3	12.5	6.3	0	0	5.25	0.93	16
16	I did what was necessary to provide more lessons in the school timetable for students.	81.3	12.5	0	6.3	0	0	5.69	0.79	16
17	I provided the students and their supervisor with a suitable place to meet one another.	87.5	12.5	0	0	0	0	5.88	0.34	16

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Table Number 3

Percentage, Means, and Standard Deviations of College Staff Responses on the Items i Questionnaire Number 2 of the Practicum Evaluation

No.	Items	Percentages of Responses to Each Item								
		Strongly Agree (6)	Agree (5)	Tend to Agree (4)	Tend to Disagree (3)	Disagree (2)	Strongly Disagree (1)	Mean of Each Item (x)	Standard Deviation (sd)	Frequency (n)
1	The preparing of the student teacher in the third year for the practicum was suitable	27.8	33.8	25.0	13.9	0	0	4.75	1.02	36
2	The student teacher mastered the content of the subject	11.1	44.4	30.6	11.1	0	2.8	4.47	1.03	36
3	I observed the student teacher many times, which helped to improve her teaching.	36.1	38.9	13.9	8.3	0	2.8	4.94	1.15	36
4	I regularly discussed the student teacher's lesson with her after she had taught it.	61.1	25.0	11.1	2.8	0	0	5.44	0.81	36
5	I think that it would be beneficial to give the third-year student teacher more than one lesson to teach daily.	38.9	27.8	8.3	22.8	0	2.8	4.75	1.34	36
6	The preparing of the student teacher in the second year for the practicum was suitable	5.6	19.4	25.0	30.6	8.3	11.1	3.5	1.36	36
7	The student teacher in the second year mastered the content of her lesson	2.8	13.9	30.6	22.2	2.8	27.8	3.08	1.52	36
8	I believe that the participation of the school principal in the practicum helped in fulfilling the goals of the practicum.	8.3	22.8	50.0	11.1	0	8.3	4.03	1.21	36
9	I think that the participation of the cooperative teacher in the practicum helped in its success.	19.4	22.2	30.6	19.4	2.8	5.6	4.19	1.35	36
10	It was not difficult for me to observe four student teachers in a day	11.1	19.4	22.2	11.1	0	36.1	3.22	1.87	36
11	I think that the evaluation form that was used in the practicum was good.	13.9	50.0	16.7	5.6	0	13.9	4.31	1./53	36
12	In my opinion the practicum was well organized this year	16.7	27.8	44.4	11.1	0	0	4.50	0.91	36
13	I think that it is necessary to have seminars on the practicum for the college	44.4	16.7	13.9	11.1	0	13.9	4.53	1.76	36

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Table Number 4 ·

Means and Standard Deviations for College Staff Responses According to Their Specialization on Each Item of Questionnaire Number 2 For Practicum

No.	Item	Specialization Groups																	
		Arabic Language (1)			Islamic Studies (2)			Geography/History (3)			Physics/Chemistry (4)			Math/Computer/Physics (5)			Educational Sci (6)		
		(n)	(x)	(sd)	(n)	(x)	(sd)	(n)	(x)	(sd)	(n)	(x)	(sd)	(n)	(x)	(sd)	(n)	(x)	(sd)
1	The preparing of the student teacher in the third year for the practicum was suitable.	6	5.00	1.10	3	4.33	1.15	6	5.33	0.82	5	4.60	1.14	8	4.13	0.99	8	5.00	0.93
2	The student teacher mastered the content of the subject.	6	4.33	0.52	3	5.00	0.00	6	5.00	0.00	5	4.00	0.71	8	4.25	1.67	8	4.50	1.20
3	I observed the student teacher many times, which helped to improve her teaching.	6	4.83	0.98	3	4.00	1.00	6	5.17	0.75	5	4.80	1.10	8	5.38	0.52	8	4.88	1.89
4	I regularly discussed the student teacher's lesson with her after she had taught it.	6	5.67	0.82	3	4.33	1.53	6	5.33	0.82	5	5.00	0.71	8	5.50	0.53	8	6.00	0.00
5	I think that it would be beneficial to give the third-year student teacher more than one lesson to teach daily.	6	4.33	1.51	3	4.67	1.53	6	4.33	1.21	5	4.60	1.14	8	4.50	1.78	8	5.75	0.46
6	The preparing of the student teacher in the second year for the practicum was suitable.	6	3.67	1.63	3	4.00	1.00	6	3.50	1.38	5	3.20	0.45	8	2.88	1.55	8	4.00	1.51
7	The student teacher in the second year mastered the content of her lesson.	6	2.50	1.22	3	3.33	2.08	6	3.17	1.72	5	3.60	0.55	8	2.25	1.58	8	3.88	1.55
8	I believe that the participation of the school principal in the practicum helped in fulfilling the goals of the practicum.	6	3.67	1.75	3	4.00	0.00	6	4.17	0.75	5	4.60	0.89	8	4.13	1.55	8	3.75	1.17
9	I think that the participation of the cooperative teacher in the practicum helped in its success.	6	4.67	1.21	3	3.33	1.15	6	4.17	0.98	5	4.60	1.34	8	4.50	1.77	8	3.63	1.30
10	It was not difficult for me to observe four student teachers in a day.	6	2.17	1.83	3	1.00	0.00	6	3.83	1.72	5	2.80	1.79	8	4.00	1.51	8	3.88	2.03
11	I think that the evaluation form that was used in the practicum was good.	6	5.17	0.75	3	3.33	2.08	6	4.00	0.63	5	3.60	1.79	8	5.13	0.35	8	3.75	2.31
12	In my opinion the practicum was well organized this year.	6	4.67	0.82	3	4.00	0.00	6	4.33	0.82	5	4.20	1.10	8	4.38	0.74	8	5.00	1.20
13	I think that it is necessary to have seminars on the practicum for the college.	6	3.67	2.33	3	4.33	1.53	6	3.67	2.25	5	5.00	1.00	8	4.63	1.77	8	5.50	1.07

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Table Number 5

A Summary of One-Way Analysis Results for College Staff Responses According to Their Specialization on Each Item of Questionnaire Number 2 for Practicum Evaluation.

No.	Item	Variance Between Groups			Variance Within groups			Value of F calc.	Level of Probability
		SS	Ms	df	SS	Ms	df		
1	The preparing of the student teacher in the third year for the practicum was suitable.	6.68	1.34	5	30.08	1.003	30	1.33	0.28
2	The student teacher mastered the content of the subject.	4.14	0.83	5	32.83	1.09	30	0.76	0.59
3	I observed the student teacher many times, which helped to improve her teaching.	4.67	0.93	5	41.22	1.37	30	0.68	0.64
4	I regularly discussed the student teacher's lesson with her after she had taught it.	7.56	1.51	5	15.33	0.51	30	2.96 *	0.03
5	I think that it would be beneficial to give the third-year student teacher more than one lesson to teach daily.	10.72	2.14	5	52.03	1.73	30	1.24	0.32
6	The preparing of the student teacher in the second year for the practicum was suitable.	6.49	1.30	5	58.51	1.95	30	0.67	0.65
7	The student teacher in the second year mastered the content of her lesson.	14.18	2.84	5	66.56	2.22	30	1.28	0.30
8	I believe that the participation of the school principal in the practicum helped in fulfilling the goals of the practicum.	3.23	0.65	5	47.74	1.59	30	0.41	0.84
9	I think that the participation of the cooperative teacher in the practicum helped in its success.	7.73	1.55	5	55.91	1.86	30	0.83	0.54
10	It was not difficult for me to observe four student teachers in a day.	32.88	6.58	5	89.34	2.98	30	2.21	0.08
11	I think that the evaluation form that was used in the practicum was good.	16.96	3.39	5	64.68	2.16	30	1.57	0.20
12	In my opinion the practicum was well organized this year.	3.66	0.73	5	25.34	0.85	30	0.87	0.52
13	I think that it is necessary to have seminars on the practicum for the college.	17.70	3.55	5	91.21	3.04	30	1.17	0.35

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Table Number 6

Summarization Of One-Way Analysis of Variance Results for College Staff Responses According to Their Specialization (1x5) On All Items of Questionnaire Number 2 for Practicum Evaluation.

Source Of Variation	SS	ms	df	F Calculated	F Probability
Between Groups	240.55	48.11	5	0.67	0.66
Within Groups	2194.68	73.16	30		
Total	2435.22		35		

Table Number 10

A Summary of One-Way Analysis of Variance Results for Cooperative Teachers' Responses According to Their Specialization (1x5) on All Items of Questionnaire Number 4 for Practicum Evaluation.

Source Of Variation	SS	MS	df	F Calc.	F Prob.
Between Groups	448.94	112.24	4	2.01	0.096
Within Groups	8263.89	55.84	148		
Total	8712.84	–	152		

Table Number 14

Summarization of 2-Way Analysis of Variance Results (2x5) for Significant Differences in the Student Teachers¢ Responses on All Items of Questionnaire Number 3 to Evaluate Practicum.

Source of Variation	SS	df	Ms	F Calculated	F Probability
Specialization	1280.82	4	320.20	*3.51	0.009
Level	188.44	1	188.44	2.07	0.15
Level x Specialization	452.51	4	113.13	1.24	0.30
Residual	14584.56	160	91.15		
Total	16370.61	169	96.87		

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Table Number 7

Percentage, Means, and Standard Deviations of Cooperative Teachers' Responses on the Items in Questionnaire Number 4 of the Practicum Evaluation.

No	Items	Percentages of Responses to Each Item						Mean of Each Item (x)	Standard Deviation (sd)	Frequency (n)
		Strongly Agree (6)	Agree (5)	Tend to Agree (4)	Tend to Disagree (3)	Disagree (2)	Strongly Disagree (1)			
1	Student teachers prepared their lesson plans well.	19.0	65.4	13.7	2.0	0	0	5.01	0.64	153
2	The objectives of the lesson to be achieved in the classroom were linked to the course	40.1	63.4	6.5	0	0	0	5.24	0.56	153
3	The student teacher mastered the content of the subject	17.0	50.3	26.8	4.6	1.3	0	4.77	0.83	153
4	I continuously observed the student teacher teaching her lesson	46.4	36.6	13.7	2.6	0	0.7	5.25	0.87	153
5	I discussed the lesson plan with the student teacher	35.3	35.3	17.0	7.8	2.0	2.6	4.86	1.19	153
6	I regularly discussed the student teacher's lesson with her after she had taught	40.5	40.5	9.8	3.3	5.2	0.7	5.06	1.10	153
7	The student teacher displayed a mastery of classroom management skills	20.3	52.3	24.8	2.0	0.7	0	4.90	0.76	153
8	I encouraged the student teacher to observe my lessons or her colleague's	51.6	34.6	9.2	4.6	0	0	5.33	0.83	153
9	In my opinion, the practicum was well organized this year.	27.5	45.1	13.7	5.5	7.2	1.3	4.76	1.20	153
10	I received a list of the student teachers names early	28.1	37.9	11.8	5.9	9.8	6.5	4.49	1.52	153
11	The communication between the college and the school was suitable	28.1	48.4	10.5	6.5	3.3	3.3	4.82	1.20	153
12	It is necessary to attend special seminars about the practicum program	15.7	41.2	25.5	10.5	4.6	2.6	4.45	1.17	153
13	I think that the experience student teachers acquire from the practicum will help them to become well qualified future teachers	33.3	44.4	14.4	7.2	0.7	0	5.03	0.91	153

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Table Number 8

Means and Standard Deviations for Cooperative Teacher's Response According to Their Specialization on Each Item of Questionnaire Number 4 for Practicum Evaluation

No.	Item	Specialization Groups														
		Arabic Language (1)			Islamic Studies (2)			Geography/History (3)			Physics/Chemistry (4)			Math/Computer/Physics (5)		
		(n)	(x)	(sd)	(n)	(x)	(sd)	(n)	(x)	(sd)	(n)	(x)	(sd)	(n)	(x)	(sd)
1	Student teachers prepared their lesson plans well	31	4.87	0.76	36	5.06	0.58	29	5.03	0.63	28	5.11	0.50	29	5	0.71
2	The objectives of the lesson to be achieved in the classroom were linked to the course	31	5.13	0.56	36	5.36	0.59	29	5.17	0.60	28	5.07	0.47	29	5.41	0.50
3	The student teacher mastered the content of the subject	31	4.84	0.64	36	4.67	0.68	29	4.90	1.05	28	4.79	1.03	29	4.69	0.76
4	I continuously observed the student teacher teaching her lesson	31	5.26	0.73	36	5.5	0.70	29	5.24	0.87	28	4.93	1.15	29	5.24	0.83
5	I discussed the lesson plan with the student teacher	31	5.00	1.24	36	5.19	0.75	29	4.59	1.35	28	4.39	1.45	29	5.03	1.02
6	I regularly discussed the student teacher's lesson with her after she had taught it.	31	5.00	1.29	36	5.44	0.88	29	4.76	1.24	28	4.96	1.04	29	5.03	0.98
7	The student teacher displayed a mastery of classroom management skills	31	5.00	0.63	36	5.06	0.75	29	4.86	0.83	28	4.75	0.70	29	4.76	0.87
8	I encouraged the student teacher to observe my lessons or her colleague's	31	5.61	0.62	36	5.31	0.95	29	5.31	1.004	28	2.25	0.70	29	5.17	0.76
9	In my opinion, the practicum was well organized this year	31	5.23	0.99	36	4.96	0.79	29	4.79	1.05	28	4.36	1.39	29	4.41	1.55
10	I received a list of the student teachers' names early	31	4.87	1.43	36	4.58	1.38	29	4.52	1.35	28	4.18	1.77	29	4.24	1.68
11	The communication between the college and the school was suitable	31	5.16	0.73	36	5.14	0.68	29	4.69	1.14	28	4.50	1.69	29	4.48	1.45
12	It is necessary to attend special seminars about the practicum program	31	4.61	1.17	36	4.58	1.11	29	4.10	1.14	28	4.26	1.35	29	4.45	1.09
13	I think that the experience student teachers acquire from the practicum will help them to become well qualified future teachers	31	5.06	0.73	36	5.14	0.68	29	5.03	0.98	28	4.82	1.02	29	5.03	1.15

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Table Number 9

A Summary of One-Way Analysis of Variance Results for the Cooperative Teachers' Responses, According to Their Specialization, on Each Item of Questionnaire Number 4 for Practicum Evaluation

No.	Item	Variance Between Groups			Variance Within groups			Value of F	Level of
		SS	Ms	df	SS	Ms	df	Calculated	Probability
1	Student teachers prepared their lesson plans well	0.96	0.24	4	61.02	0.41	148	0.58	0.68
2	The objectives of the lesson to be achieved in the classroom were linked to the course	2.71	0.68	4	44.82	0.30	148	2.24	0.068
3	The student teacher mastered the content of the subject	1.19	0.30	4	103.80	0.70	148	0.42	0.79
4	I continuously observed the student teacher teaching her lesson	5.15	1.29	4	109.41	0.74	148	1.74	0.14
5	I discussed the lesson plan with the student teacher	13.8	3.45	4	202.32	1.37	148	2.52	0.04*
6	I regularly discussed the student teacher's lesson with her after she had taught it	8.34	2.09	4	176.13	1.19	148	1.75	0.14
7	The student teacher displayed a mastery of classroom management skills	2.43	0.61	4	85.90	0.58	148	1.05	0.39
8	I encouraged the student teacher to observe my lessons or her colleague's	3.41	0.85	4	100.59	0.68	148	1.25	0.29
9	In my opinion, the practicum was well organized this year	15.99	3.99	4	201.53	1.36	148	2.94	0.02*
10	I received a list of the student teachers' names early	9.34	2.34	4	342.89	2.32	148	1.01	0.41
11	The communication between the college and the school was suitable	13.93	3.48	4	204.95	1.39	148	2.52	0.04*
12	It is necessary to attend special seminars about the practicum program.	4.95	1.24	4	202.93	1.37	148	0.90	0.46
13	I think that the experience student teachers acquire from the practicum will help them to become well qualified future teachers	1.68	0.42	4	124.22	0.84	148	0.50	0.74

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Table Number 11

Percentage, Means, and Standard Deviations of Student Teachers' Responses on the Items on Questionnaire Number 3 of the Practicum Evaluation

No.	Items	Percentages of Responses to Each Item								
		Strongly Agree (6)	Agree (5)	Tend to Agree (4)	Tend to Disagree (3)	Disagree (2)	Strongly Disagree (1)	Mean of Each Item (x)	Standard Deviation (sd)	Frequency (n)
1	The lessons in the isolated and continuous practicum helped to improve my teaching competencies.	50.8	32.4	9.4	5.3	0.60	1.8	5.22	1.05	170
2	The principal followed my work at the school effectively.	6.5	15.3	22.4	26.5	3.5	25.9	3.17	1.57	170
3	The principal welcomed me at the beginning of the practicum, gave me advice, and provided me with information about the school.	10.6	12.4	18.8	19.4	7.1	31.8	3.05	1.73	170
4	My participation in the practicum definitely helped my preparation academically and educationally.	32.9	36.5	20.6	5.9	1.2	2.9	4.85	1.15	170
5	The school environment was encouraging and comfortable.	21.8	27.6	23.5	17.1	1.8	8.2	4.26	1.44	170
6	I prefer that the cooperative teacher be present during my lesson.	21.8	18.8	15.3	16.5	8.8	18.8	3.72	1.79	170
7	I prefer that the cooperative teacher discuss my lesson as a whole after I have finished teaching it.	35.3	27.6	14.1	11.2	3.5	8.2	4.55	1.55	170
8	Being observed in my teaching many times by the college supervisor helped improve my teaching ability.	52.4	32.9	8.8	4.1	0	1.8	5.28	0.99	170
9	The college supervisor always had a discussion with me after my lesson.	47.1	32.4	15.3	4.7	0	0.6	5.20	0.93	170
10	The discussion with the college supervisor after my lesson was helpful to me.	63.5	22.9	10.0	2.4	0.6	0.6	5.45	0.88	170
11	Microteaching provided me with the essential teaching skills to be prepared as a good teacher in the future.	32.9	32.4	22.4	6.5	4.1	1.8	4.78	1.19	170
12	The educational workshops helped me to acquire the essential teaching skills to be prepared as a good teacher in the future.	18.2	31.8	25.9	10.0	7.6	6.5	4.24	1.41	170
13	The academic courses gave me the knowledge and necessary skills to be a qualified teacher in the future.	21.2	34.7	27.1	10.0	2.4	4.7	4.48	1.26	170
14	The educational courses gave me the essential competencies to be a good teacher in the future.	14.1	27.1	35.9	16.5	2.4	4.1	4.22	1.19	170
15	Sharing in the school activities helped develop my personality to be a good teacher in the future.	19.4	37.1	18.2	13.5	2.9	8.8	4.3	1.45	170
16	In my opinion, the practicum was well organized this year.	10	34.1	22.4	23.5	8.8	1.2	4.09	1.2	170

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Table Number 12

Means and Standard Deviations for Student Teachers' Responses According to Their Specialization on Each Item of Questionnaire Number 3 for Practicum Evaluation

No	Item	Specialization Groups														
		Arabic Language (1)			Islamic Studies (2)			Geography/History (3)			Physics/Chemistry (4)			Math/Computer/Physics (5)		
		(n)	(x)	(sd)	(n)	(x)	(sd)	(n)	(x)	(sd)	(n)	(x)	(sd)	(n)	(x)	(sd)
1	The lessons in the Isolated and continuous practicum helped to improve my teaching competencies.	41	4.85	1.20	28	5.25	0.89	27	5.41	0.89	27	5.37	1.15	47	5.32	1.002
2	The principal followed my work at the school effectively.	41	3.41	1.30	28	3.25	1.67	27	2.63	1.57	27	3.59	1.67	47	2.98	1.62
3	The principal welcomed me at the beginning of the practicum, gave me advice, and provided me with information about the school.	41	3.15	1.78	28	3.07	1.68	27	2.78	1.87	27	3.89	1.65	47	2.62	1.55
4	My participation in the practicum definitely helped my preparation academically and educationally.	41	4.12	1.60	28	4.96	0.96	27	5.33	0.73	27	5.26	0.81	47	4.92	0.86
5	The school environment was encouraging and comfortable.	41	3.85	1.61	28	4.64	1.25	27	3.56	1.53	27	4.82	1.42	47	4.47	1.12
6	I prefer that the cooperative teacher be present during my lesson.	41	3.07	1.02	28	4.25	1.56	27	3.74	2.11	27	3.78	1.37	47	3.92	1.83
7	I prefer that the cooperative teacher discuss my lesson as a whole after I have finished teaching it.	41	4.02	1.48	28	4.79	1.45	27	4.41	1.85	27	4.56	1.53	47	4.96	1.40
8	Being observed in my teaching many times by the college supervisor helped improve my teaching ability.	41	5.45	0.94	28	5.29	1.15	27	5.41	1.19	27	5.30	0.82	47	5.32	0.94
9	The college supervisor always had a discussion with me after my lesson.	41	5.10	0.83	28	5.50	0.97	27	5.15	1.03	27	5.30	0.91	47	5.09	1.04
10	The discussion with the college supervisor after my lesson was helpful to me.	41	5.34	0.82	28	5.46	0.84	27	5.70	0.54	27	5.70	0.61	47	5.23	1.17

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Means and Standard Deviations for Student Teachers' Responses According to Their Specialization on Each Item of Questionnaire Number 3 for Practicum Evaluation

Table Number 12 (continued)

No.	Item	Specialization Groups														
		Arabic Language (1)			Islamic Studies (2)			Geography/History (3)			Physics/Chemistry (4)			Math/Computer/Physics (5)		
		(n)	(x)	(sd)	(n)	(x)	(sd)	(n)	(x)	(sd)	(n)	(x)	(sd)	(n)	(x)	(sd)
11	Microteaching provided me with the essential teaching skills to be prepared as a good teacher in the future.	41	4.78	1.33	28	4.79	1.07	27	5.15	0.95	27	4.63	1.45	47	4.66	1.11
12	The educational workshops helped me to acquire the essential teaching skills to be prepared as a good teacher in the future.	41	4.15	1.44	28	4.25	1.21	27	3.89	1.65	27	4.44	1.45	47	4.38	1.34
13	The academic courses gave me the knowledge and necessary skills to be a qualified teacher in the future.	41	4.37	1.26	28	4.43	1.20	27	4.70	0.21	27	4.85	1.41	47	4.28	1.23
14	The educational courses gave me the essential competencies to be a good teacher in the future.	41	3.85	1.24	28	3.96	1.11	27	4.70	1.07	27	4.74	1.02	47	4.11	1.22
15	Sharing in the school activities helped develop my personality to be a good teacher in the future.	41	4.37	1.46	28	4.21	1.45	27	4.26	1.35	27	4.81	1.55	47	4.02	1.44
16	In my opinion, the practicum was well organized this year.	41	3.83	1.12	28	4.00	1.28	27	4.82	0.96	27	4.41	1.05	47	3.79	1.25

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Table Number 13

Summarization of 2-Way Analysis of Variance Results (2x5) for Significant Differences in the Student Teachers' Responses of Each Item of Questionnaire Number 3 for Practicum Evaluation

No.	Items	Specialization Groups					Level					Level x Specialization					Residual		
		SS	df	Ms	F Calc.	F Prob.	SS	df	Ms	F Calc.	F Prob.	SS	df	Ms	F Calc.	F Prob.	SS	df	Ms
1	The lessons in the isolated and continuous Practicum helped to improve my teaching competencies.	6.38	4	1.60	1.47	0.22	2.998	1	2.998	2.75	0.099	2.24	4	0.6	1.50	0.73	174.17	160	1.09
2	The principal followed my work at the school effectively.	17.05	4	4.26	1.76	0.14	0.40	1	0.40	0.17	0.69	13.43	4	3.36	1.39	0.24	387.17	160	2.42
3	The principal welcomed me at the beginning of the practicum, gave me advice, and provided me with information about the school.	29.33	4	7.33	2.61*	0.04	0.09	1	0.09	0.03	0.86	26.00	4	6.5	2.32	0.06	449.33	160	2.81
4	My participation in the practicum definitely helped my preparation academically and educationally.	29.98	4	7.49	6.65*	0.00	1.72	1	1.72	1.53	0.22	10.20	4	2.55	2.26	0.07	180.28	160	1.13
5	The school environment was encouraging and comfortable.	35.01	4	8.75	4.81*	0.001	4.36	1	4.36	2.4	0.12	20.33	4	5.08	2.79*	0.03	291.3	160	1.82
6	I prefer that the cooperative teacher be present during my lesson.	28.95	4	7.24	2.39*	0.05	11.79	1	11.79	3.89*	0.05	19.42	4	4.86	1.60	0.18	484.34	160	3.03
7	I prefer that the cooperative teacher discuss my lesson as a whole after I have finished teaching it.	21.09	4	5.27	2.31	0.06	2.52	1	2.52	1.10	0.30	14.35	4	3.59	1.57	0.19	365.92	160	2.29
8	Being observed in my teaching many times by the college supervisor helped improve my teaching ability.	1.56	4	0.39	0.39	0.81	1.09	1	1.09	1.10	0.30	5.72	4	1.43	1.44	0.22	158.39	160	0.99
9	The college supervisor always had a discussion with me after my lesson.	4.32	4	1.08	1.26	0.29	1.73	1	1.73	2.01	0.16	3.89	4	0.97	1.13	0.34	137.69	160	0.86

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Table Number 13 (Continued)
Summarization of 2-Way Analysis of Variance Results (2x5) for Significant Differences in the Student Teachers' Responses of Each Item of Questionnaire Number 3 for Practicum Evaluation

No.	Items	Specialization Groups					Level					Level x Specialization					Residual		
		SS	df	Ms	F Calc.	F Prob.	SS	df	Ms	F Calc.	F Prob.	SS	df	Ms	F Calc.	F Prob.	SS	df	Ms
10	The discussion with the college supervisor after my lesson was helpful to me.	5.53	4	1.38	1.80	0.13	0.11	1	0.11	0.14	0.71	2.73	4	0.68	0.89	0.47	123.03	160	0.77
11	Microteaching provided me with the essential teaching skills to be prepared as a good teacher in the future.	7.51	4	1.88	1.42	0.23	20.18	1	20.18	15.30*	0.00	4.76	4	1.19	0.90	0.46	211.06	160	1.32
12	The educational workshops helped me to acquire the essential teaching skills to be prepared as a good teacher in the future.	5.61	4	1.40	0.71	0.58	6.79	1	6.79	3.46	0.07	9.94	4	2.49	1.27	0.29	314.09	160	1.96
13	The academic courses gave me the knowledge and necessary skills to be a qualified teacher in the future.	9.49	4	2.37	1.52	0.20	3.06	1	3.06	1.97	0.16	8.35	4	2.09	1.34	0.26	249.4	160	1.56
14	The educational courses gave me the essential competencies to be a good teacher in the future.	27.11	4	6.78	5.27*	0.001	10.03	1	10.03	7.79*	0.006	3.35	4	0.84	0.65	0.63	205.99	160	1.29

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Defining a Role for ESP in Arabic Medium Colleges of Education in Oman

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Our paper discusses issues surrounding the introduction of an ESP program to Colleges of Education in the Sultanate of Oman.

These colleges use Arabic medium of instruction for all other subjects and draw their student body mainly from rural areas of Oman. English is offered in the first and third years of study-graduates do not have English as a major. The students will largely return to teach in Arabic-medium elementary and secondary schools throughout Oman.

The first issue addressed is therefore to arrive at a rationale for ESP in this context where the need for it may not be immediate or apparent. Recognizing therefore a broader role for ESP in terms of facilitating access to technology and innovation in education, our paper then illustrates how course outlines were developed in order to incorporate the use of the new Learning Resources Centers, multimedia technology and student-centered learning.

We then look at the difficulties encountered in defining ESP course content for different student specialities (such as Arabic Language, Islamic Studies, Social Sciences and Natural Sciences) while at the same time ensuring overall language development.

Finally we give a brief critical appraisal of the initial implementation of the course to date.

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Defining a role for ESP in Arabic Medium Colleges of Education in Oman

Preamble

The aim of this paper is to present an account of the genesis of an ESP course in a particular place and time and at a particular juncture in the development of our colleges. There is considerable emphasis therefore on the background and developmental aspects of the project. The paper does not attempt to exhaustively survey the current thinking in any branch of ESP. However, we hope that our paper illustrates how awareness of modern trends and developments in language teaching can be combined and integrated with local conditions to produce an appropriate course adapted to the specific needs of the students.

Background

The Colleges of Education in Oman run a four-year B.Ed. program with subject specialisms in the following areas: Physics, Biology, Chemistry, Mathematics, Geography, History, Islamic Studies and Arabic Language. Computer Science is offered as a subsidiary but all students take introductory courses in Computer Studies. All subject specialisms and Education courses are taught in Arabic. The graduates of these colleges will largely return to teach in elementary and secondary schools throughout Oman. All students also take three credit hours of English over their first and second semesters. Three credit hours of ESP are offered in the third or fourth years of study.

The four-year program began in the academic year '94/95 and the first intake of students will graduate at the end of the present academic year, '97/98. As the colleges are new the ESP course is being offered for the first time this year to third and fourth year students. The colleges also have new state-of-the-art Learning Resource Centers which opened this year. The LRCs will have open access computer labs and media labs which are currently being installed. The developing nature of the college sites and facilities and the possibilities which this offered to ESP course design, will be discussed later.

Our students don't have as much exposure the cultural aspects of English language (such as cinema, satellite TV, pop music etc.) as students in the larger cities of the Gulf and which sometimes make students more receptive to English as an international language. However, this situation is changing rapidly with the arrival of the Internet in January 1997, and the increasing penetration of telecommunications technology in general.

Evolution of the ESP Project

In the academic year preceding its introduction, the staff of the English sections were invited to submit proposals, hold a number of meetings and workshops and eventually write course outlines for the various ESP courses. In the early stages of these deliberations the debate seemed to crystallize around a small number of issues. These were as follows:

a) The perception that ESP might properly be the domain of subject specialist and not that of the English section.

b) What would the overall aims of the course be – given that our students were in Arabic medium colleges and would return to teach in Arabic medium schools?

c) To what extent would ESP course content parallel the course content of the specialisms and more broadly, what would the overall relationship be in terms of content and approach with the specialist departments?

d) How to find or create ESP materials for students of such subjects as Arabic Language, Islamic Studies, Geography and History. (Catalogs abound with ESP materials for Science, Technology, Business, Medicine and Engineering, the traditional areas where knowledge of English was expected and where ESP was already an established industry.)

e) Finally, teachers expressed concern and some disagreement over the level of general English required before a full and meaningful ESP course might be embarked upon.

The above considerations fell into two major areas of concern. Firstly, *the definition of the aims of the course* and secondly, *the determination of course content and methodology to fulfill these aims* and to satisfy the concerns of the course designers and teachers regarding the degree of specificity.

Defining General Aims of the Course

In arriving at a statement of the general aims of the course we were obliged to take into account the following factors:

a) The course was not being proposed as a preparation in academic English to allow our students to follow university lectures delivered later in English. Its presence on the syllabus was rather to be justified as foreign language course related to the students' specialities and thereby serving to provide variety on the overall program of study.

b) Although we were aware that in the future some subjects (probably

Sciences) might be taught in schools through English this was not then the case and our students did not have an immediate need to teach in English.

c) The college campuses were also changing rapidly with the opening of the new Learning Resource Centers, increased access to communication and educational technology would soon be available.

d) We also felt that English could perform a supplementary educative role particularly in attempting to bridge the gap between established theory of textbooks and the rapidly changing and topical ideas on the environment and applications of science largely accessible first only through language journals, magazines and audiovisual media.

The final wording of the aims for the ESP for Sciences reflect these concerns:

ESP for Science: Aims

a) To encourage students to recognize English as a tool which will assist them in their studies and subsequent work.

b) To enable students to learn English using materials that interest them and to focus their general knowledge of English on their subject areas.

c) To give students access to a pool of international knowledge, increasingly available through modern communications technology.

d) To foster, the students' interest in contemporary issues and developments in science.

The Introduction to the ESP for Sciences outline also states that the course will require students to complete some simple research tasks which will require the use of the LRC and that some of the reference materials will be in multimedia format. In addition, the course outline for sciences states that the emphasis throughout the course will be on topical aspects of science and the application of scientific principles to everyday life (See Appendix 2). This would serve a dual function. Firstly, to avoid the re-teaching of theoretical content of physics lectures (which teachers of English would be incapable of doing), and secondly, to stimulate interest in contemporary issues and developments in science.

As the course outlines began to take shape it gradually became apparent that ESP in the context of colleges of education could take on a specific character. The self-reflexive nature of teacher-training process could be exploited also in the ELT classroom to encourage discussion on aspects of education such as course content, methodology, assessment, technology in education, etc. (Students in our colleges begin teaching practice in their second

year of study). It was also felt that the methodologies employed should reflect more innovative approaches to teaching in keeping with the general policy of the Ministry of Higher Education.

Integrating the use of the LRCs with the ESP course Aims and Methodology.

The course outlines proposed a model for the exploitation of the facilities of the LRCs in order to formalize their inclusion as an integral part of the realization of the objectives of the course. A typical module would incorporate the use of the LRC in the following way. At the beginning of the course the class is introduced to the LRC, its facilities, its functions etc. The teacher now teaches the language and study skills needed to tackle specific research tasks within the students' ability and according to their recognized needs. Individuals or groups of students are assigned specific tasks and are given a date by which they must report back to the class on their findings. During the research phase the teacher's role is that of facilitator or guide. All groups or individual students report back to class by the agreed deadline. The report back session might take the form of submitting a paper report, giving a presentation with visuals and charts etc., handling a question and answer session, chairing a discussion etc.

Groups are assessed by the teacher immediately after report-back sessions. Feedback is given in the form praise or advice for improvement. (4).

The Search for ESP Materials

In the the search for published material we surveyed all the available publishers catalogs. It soon became apparent that ESP publishing was still dominated by the traditional areas where a knowledge of English was regarded as necessary. At the academic end of the scale these included medicine, engineering, business studies and technology. There is also another category of ESP publishing which is designed to meet the needs of workers and semiprofessionals in such areas as the hotel and tourism trade, technicians in oil and gas industry etc. The former were largely unsuitable in so far as they were written for specific professions and generally assumed at least an intermediate level of English. The latter, although closer to our needs in terms of the level of English, were again unsuitable in that they were designed for narrowly defined target groups. Ways in which the learner was depicted in this latter category-technicians, mechanics, hotel receptionists etc. – might also clash with a student-teacher's socio-cultural image of himself. Textbooks written for English for Academic Purposes generally meet the needs of students in pre-sessional courses preparing to embark on degree and postgraduate programs

of study through English. Again these did not correspond exactly to our needs.

One source which did seem quite promising was that of junior and secondary school textbooks. These were generally well-illustrated, had a graded language level and usually included good examples and applications of ideas. Although these would generally not be suitable as core textbooks, they would prove suitable as teacher reference works and in some cases class sets could be purchased. However, it was recognized that school textbooks as sources for ESP were not written for the purpose of language teaching and would necessitate considerable adaptation and addition of supplementary language reinforcement. Another related criticism of school textbooks was their presentation of content in too simplified a manner, especially in the case of books written for children and young teenagers.

The search for multimedia reference material proved more interesting and fruitful. The novelty of this medium and rapidly expanding capabilities of CD-ROM technology would in itself be a strong source of motivation. Being used as reference materials, teachers would be less concerned about the language difficulty presented by CD-ROM's. This problem would also be alleviated by the use of pictures, videos, animations and illustrations in CD-ROM's (See Appendix 1 for list of CD-ROM's suggested for sections of the ESP course.)

The degree to which published materials could be directly useful did vary considerably depending on the specialism. In general, we found that it was relatively easy to find usable materials for the science specialisms but quite difficult for History and Geography as well as Arabic Language and Islamic Studies. In these areas it would be necessary for teachers to design most of their own materials. This matter is discussed in more detail in the next section with specific reference to designing a course for students of Arabic Language and Islamic Studies.

Report on ESP for Arabic Language and Islamic Studies

Certainly the two most challenging courses we were asked to set up were the ESP courses for Arabic and Islamic studies. The ESP for Arabic Studies hinged around things literary and thus was felt to rely more on critical terminology, short narrative passages, poetry, travel literature etc. The materials recommended for the course include interactive approaches such as *Chapter and Verse* (1), a glossary of literary and grammatical concepts, graded readers and video cassettes of major BBC movies.

The greatest challenge however came from the ESP for Islamic Studies course. From the outset colleagues involved in setting up the course agreed to

allow it to be taught only by Muslim teaching staff. Indeed it was felt that sensitive religious feelings were better dealt with by the Muslim teachers and preferably-because of the terminology involved, – by speakers of Arabic. In our view, this proved to be a wise decision. It must be added that to our knowledge no ESP course for student-teachers with Islamic Studies as a specialism has ever been published, so finding and setting up new materials for this course was certainly considered to be the greatest challenge. Although a great deal of published material in English can be found on Islam, it proved hard getting hold of:

a) materials that would be reasonably accessible for our students in terms of level of difficulty.

b) non-biased published materials on Islam.

c) video, audio or other multimedia materials on Islam.

As the aims of the course make clear the combination of the subject and the language forms should eventually allow students to read and comprehend both spoken and written texts in their subject. The main areas of focus in the courses are: a) The basic concepts of Islam; b) The application of the Faith, and c) The application of Islam to daily life.

From our short experience of teaching the course and because of the nature of the topic, it has certainly proved to be a highly interactive and original experience. Student participation is usually high in class, with more of the interest in the aspects of Islam discussed than in the purely linguistic objectives. In the third week of the course some of the students offered to recite (in English) one of the texts – basically a prayer – given to them as a class handout. This was extremely well received.

In a certain sense these courses do challenge the received views of the teaching of ESP in academic institutions. Firstly, both courses do have to rely on a bilingual glossary of terminology which will facilitate English language acquisition in a more rapid way. Secondly, to the extent that these courses focus heavily on content, (especially in ESP for Islamic Studies) to stimulate student interest.

Familiarity with content in this case provides the student with sufficient confidence in tackling material in class. Conscious linguistic communication is superseded at this point by the desire to communicate ideas per se. It is in this regard that knowledge of Arabic on the part of the teacher and the parsimonious use of some terminology in Arabic can facilitate the exchange of

ideas and avoid the interruption of conversation that explanation of difficult terminology requires.

The Scope of ESP for Colleges of Education

There are a number of ways in which ESP can be used to reinforce the common curriculum of a college of education, in addition to its role in the subject specialisms.

Three areas have been identified here. These are, Education, Study Skills and Library Skills. One can easily imagine the extension of these to other areas such as Child Development and Psychology, Methodology, Sociology of Education etc.

b) Education and ESP

There are many ways in which ESP can include aspects of the education program. Students are asked to obtain copies of school prospectuses from a number of English medium schools. Teacher provides introductory vocabulary lesson on school prospectuses, their language, and aims. Groups of students are then invited to analyze these from particular points of view: e.g. core curriculum, extra-curricular activities, educational and sporting facilities, school philosophy, etc. Individual students or groups prepare a comparative report on the schools. Where information in the brochures is inadequate, students would be required to telephone or visit the schools to seek further clarification. Equally student could visit the home pages of schools on the Internet, download the relevant information and perform similar comparisons.

b) Study Skills

This is an important area which can be approached in ESP in a number of ways. English for academic writing includes such concepts as how to structure a paragraph; how to organize ideas by drawing diagrams; note-taking; writing topic and supporting sentences; giving examples, drawing conclusions, etc. In addition to these, the graphic representation of information in flowcharts, spider maps, fish-bone maps, chains, cycles can be incorporated into the writing component of the course and their broader application will easily become apparent. Bar charts histograms, pie-charts, line graphs and tables are already a standard part of textbooks. However, students-teachers can be encouraged to be conscious of these means of presenting data. In this respect it can be pointed out that study skills are also of relevance from the point of view of the psychology of learning. The importance of understanding visu Al spatial intelligence and ways in which teachers can establish a visual

learning environment has been dealt with in detail in a number of recent publications (2).

c) **Library Skills**

This is another area where ESP can play cross-curricular role in the College of Education program. This area also lends itself particularly well to task work. It is often taken for granted that students know how to find what they want in a modern library. Topics addressed in class could cover basic publication details, types of subject classification, subject and author indexing, academic journals, reference works. This could lead on to more advanced work on how to look up information on a particular subject. Students could be assigned simple reference and research tasks. Library skills could be taught as a separate module towards the beginning of the course. Tasks could then be included in subsequent lessons so that they are related to a topic being studied and also serve to reinforce library skills throughout the course (3).

Conclusion and Evaluation

In this paper we have attempted to outline the ways in which our ideas about the ESP course evolved as we reflected on it, in trying to define our aims and find appropriate materials and methodologies to fulfill these aims. However it has not been possible as yet to fully implement the recommendations of the course outlines for a number of reasons. Some of these reasons will be apparent from the earlier sections of this paper dealing with the difficulty of finding appropriate materials. It must also be borne in mind that the courses were discussed, planned and implemented locally by the teachers of the six colleges under the aegis of the Ministry of Higher Education and therefore might not conform to a purist's idea of ESP at this level. In this respect also we must remember that we are indeed defining a role for ESP in Arabic-medium Colleges of Education and not in the usual context of English for Academic Purposes.

Writing this paper has given us the opportunity to reflect further on our project especially at this crucial stage of initial implementation. As we stated in our original recommendations to the Ministry of Higher Education our objective was to create a file of materials adapted to the local teaching environment and tailored to the needs of our students. This can only be definitively achieved after these materials have been tried out in the classroom.

We hope that our comments on the course have highlighted these developmental aspects as well as the potential that lies ahead for it when the Learning Resource Centers are fully operational.

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(1) McRae, John, and Luisa Pantaleoni. *Chapter and Verse: An Interactive Approach to Literature.* OUP.

(2) Campbell, Linda, et al. *Teaching and Learning Through Multiple Intelligence. 1996* Allyn and Bacon.

(3) Although too advanced for our students, a textbook which illustrates how Study Skills and Library Skills can be incorporated in a course of English for Science is: Luttikhuizen, Frances. *The World of Science and Technology.* 1995 University of Michigan Press.

(4) This schema for utilization of the LRCs was originally proposed by the teachers of the English Section at Sur Teachers' College of Education.

Appendix 1

Multimedia Materials

Examples of CR ROM's recommended

a)	The Grammar ROM	(Longmans)
b)	The Tense Buster	(Clarity English Software)
c)	Encarta '97 Encyclopedia	(Microsoft)
d)	The Challenge of the Universe	(Oxford CD ROM)
e)	Inventors and Inventions	(Nelson)
f)	The Way Things Work	(Dorling Kindersley)

Appendix 2

List of Course Topics for ESP for Science.

a) **Energy** – Sources of energy. The Petroleum Industry. Global aspects of energy. Alternative sources of energy.

b) **Food, Nutrition, Diet and Health** – The nutritional content of common food. Health and Diet. The Food Chain and Diseases.

c) **Environmental Issues** – Global Warming. Ozone Depletion. Pollution. Waste Disposal and Recycling. Desert Ecosystems.

d) **Space and Space Exploration.** The History and Purpose of Space Exploration. The Technology of Space Exploration.

e) **Telecommunications** – Modern telecommunications technology. Functions of Satellites. Mobile Phones and the Internet. Their effect on lifestyles.

f) **Other Applications of Science in Everyday Life** – Lasers. Thermostats. Refrigeration and Air Conditioning. Traditional ways of cooling buildings in the Gulf.

g) **Famous Scientists**

h) **Laboratory Equipment and Terminology**

The Trainee-Teacher as a Researcher: The Use of Reflection in Foreign Language Teacher Education

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The Trainee-Teacher as a Researcher: The Use of Reflection in the Pre-Service Training of EFL Teachers

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The present paper explores the use of reflection as a tool for the undergraduate pre-service training of EFL teachers in one of the Arab universities. The subjects, who were 28 trainees in the last two semesters of their BA program in English Education, produced, in the course of their training, diaries about their practical teacher education experience (a total of 140 entries, 5 for each). The analysis, which was predominantly qualitative, revealed five main categories of diary content and 13 constituent sub-topics, (narratives, the self, the "others", the teaching profession, and the curricula). Based on the analysis, the trainees' experience was found to be characterized by: (1) a complex combination of positive and negative emotions (e.g. feelings of pride, along with fear and stress, (2) preoccupation with immediate needs and teaching issues (linguistic and pedagogical) that have observable consequences, (3) important changes over time (e.g. from effectively-dominated to the cognitively-dominated concerns), and (4) the prominent role of the pupils in the trainees' perceived level of success. Among the implications of these findings is that the preparation of the undergraduate EFL student-teacher should address the trainees' needs (linguistic, cognitive and affective). The benefits and uses of reflection in teacher education are also discussed.

The Trainee-Teacher as a Researcher: The Use of Reflection in Foreign Language Teacher Education

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Background

The "making of a teacher" is not only a major socio-economic investment, but also an important psychological transformation in the life of the individual who prepares to get into this profession. Most of the work that has been done on the topic has, quite understandably, concentrated on the teacher-training programs (i.e. training inputs), or on the competencies (to be) demonstrated by teachers after a training or teaching experience (i.e. training outputs). Only recently have educators started concerning themselves with the actual process of becoming a teacher, that is the actual psycho-educational experiences that teachers go through during training or self-development. The topics that have been covered within this process-oriented view on teacher education include (1) the psychological stages in teacher development (e.g. McNally, Cope, Inglis & Stronach, 1994), (2) the needs and frustrations of beginning teachers (e.g. Veenman, 1984), (3) the processes involved in the attainment of professional knowledge and skills (e.g. Lange & Burroughs-Lange, 1994), (4) the factors that are related to change in novice teachers' behavior (e.g. Sardo-Brown, 1996), (5) the thought processes of beginning teachers (e.g. Hoover, 1994), and (6) teachers' changing beliefs about teaching and the roles of these beliefs in teacher behavior (e.g. Johnson, 1994; Rust, 1994), to name only the important ones.

In foreign language teacher education, serious attempts have been made in the last few years to keep up with mainstream teacher development research. Thus, the foreign language literature has been enriched in the last few years by a new body of research which has focused on teacher development and the process of "becoming a teacher". Highlighted in this research are the currently popular topics of "teacher-learning", "teacher development" "action research"

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and "classroom research" (Richards & Lockhart, 1994; Allwright and Bailey, 1991; Wallace, 1991; Chaudron, 1990; Richards and Nunan, 1990), all of which stress the importance of self development and process-oriented teacher education as opposed to the traditional view and practice of prescriptive training. As a part of this emerging interest in teacher self-development and process-oriented foreign language teacher education, a number of explorations have been made. These explorations have covered the issues that may be investigated by the practicing or trainee teacher (e.g. teacher 's beliefs and behavior, classroom interaction...). But more important than these topics are the approaches and techniques for self-development and process-oriented training. Among the approaches that are stressed for this purpose is the so-called "reflective approach".

Although reflection is not a new concept in education, its use to describe teacher training practices did not start until a few years ago. It is a part of the increasingly popular tradition in pedagogical inquiry and teacher development known as "classroom research ", which is itself an outgrowth of the so called "teacher-as-a-researcher" movement. Reflection, along with the entire movement that it is a part of, emphasizes the self-driven inquiry into the different aspects of teaching and thus makes the teacher largely responsible for his/her own professional development. Elaborating on the conceptualization of reflection made by Dewey, who is credited with the introduction of this concept in modern education, Hatton & Smith (1995: 33), define it as "an active and deliberative cognitive process, involving sequences of interconnected ideas which take account of underlying beliefs and knowledge". While reflection is sometimes concerned with problem-solving, its common uses in teacher training are not necessarily driven by specific practical problem (Hatton & Smith, 1995: 35).

Perhaps the most common non-problem-based reflection tool in teacher education is the diary studies. As used in the context of teacher development, a diary study is "a first person account of ... a teaching experience, documented through regular, candid entries in a personal journal, and analyzed for recurring patterns or salient events" (Bailey, 1990: 215). It has been used in the last few years in a number of classroom-based studies. (See, for example, Allwright & Bailey, 1990.)

Despite its growing popularity, the use of diary studies in the development of non-native language teachers is still largely limited. Among other things, it has been applied mostly to second language teachers who teach or are

preparing to be teachers in a second language context (e.g. ESL in the U.K or the USA). Very little use, if any, has been made of the instrument or any other type of reflective approach in the training or professional development of foreign language teachers (e.g. teachers of English where this language is not used in the environment). Its use has also been limited to teachers who are receiving or have received training at an advanced (graduate) level. Very little research, including the use of the diary study approach, has been done on the professional development of student-teachers who are receiving training at a lower (undergraduate) level and who are at the same time preparing to be foreign language teachers. Although these student-teachers have a lot in common with the other non-native language teachers, they exhibit specific characteristics that make them a special population. For example, they perform their self-development tasks with a limited proficiency in the foreign language and a lower academic level than the typical subjects in the related literature do. These limitations necessarily translate into special concerns and thus the diary studies with this kind of subjects are likely to reveal findings that are different from those reached in the rest of the research. In addition, the existing diary studies that are available have been conducted largely with small samples of subjects, which can severely limit the generalizability of the results. The present study seeks to make a contribution, however small, to the filling of an important gap in the literature, by using the diary study approach with a fairly large sample of subjects from a generally neglected category of language teachers.

This study seeks to address two related questions. They can be stated as follows:

a) What are the main pre-occupations of undergraduate EFL student-teachers in their initial teacher-training experience, as indicated by the topics covered in their diaries?

b) What are the trainees' perceptions about the different aspects of their initial teaching experience and what developments, if any, occur in theses perceptions?

METHODOLOGY

Subjects

The sample of the present study was made up of 28 student- teachers in an undergraduate English Education program in one of the Arab universities. These subjects constituted two separate groups that represented two instructional levels: 10 male students from Semester 7 (beginning of the fourth

year) in the 1996-97 academic year, and 18 students (8 males and 10 females) from Semester 8 (end of the fourth year) in the 1995-96 academic year. No contrasts were possible between males and females, for the males were represented in only one semester. Typically, these students take their teaching preparation courses in the last three semesters in their undergraduate program, that is in Semesters 6, 7, and 8. These courses are: (1) Methods of Teaching English as a Foreign Language 1 and 2, two courses which are taken in Semester 6 and Semester 7 respectively, and include a Micro-Teaching component (two hours a week in each) as well as a regular lecture session (also two hours a week), (2) Practice Teaching 1, taken in Semester 7, with one day a week of teaching experience at the Junior level, and (3) Practice Teaching 2, taken in Semester 8, with two days a week, one at the Junior level and the other at the Senior level.

Material

The data for this study consisted of copies of diaries which the subjects were asked to keep about their experience as "trainee-teachers". Semester 8 students were able to cover in their diaries all the training components, while Semester 7 students were not able to cover the second round of practice-teaching taken in Semester 8. Keeping the diary was a free writing task in which the subjects were encouraged to choose the content or issues to deal with. They were only told that they were expected to: (1) to record and think ("reflect") about their experience as student-teachers, and (2) to write one entry of about 200 words every two weeks and thus produce five entries per semester. The resulting material was a total of 140 entries.

Data analysis

The data was analyzed in a predominantly qualitative manner, although it did involve the specification of some quantitative information (frequencies). The analysis involved four main steps:

a) Reading the 28 packages of entries several times to determine the topics and ideas covered in the diaries.

b) Developing a content analysis grid with the topics, with spaces provided for the descriptive and reflective statements about each of the topics.

c) Using the grid to analyze the diaries in terms of the topics, the descriptive segments and the reflective statements made under each., along with their frequencies of occurrence. Naturally, these segments and statements were reported on the grid in summary form for the sake of simplicity; however,

the actual paragraph where they appeared was highlighted in the diary entries for subsequent qualitative inspection.. A descriptive segment was defined as a narrative account of an event or events (e.g. an instructional narrative). A reflective statement, on the other hand, was defined as any critical comment or the expression of a thought or feeling about the events or the aspects of the teacher-training situation. A topic or sub-topic was treated as significant and therefore worthy of mention in the final tabling of results if it occurred a minimum of ten times in the whole data set.

d) Examining the elements in the grid (topics, the narratives and the reflective statements, along with their frequencies), as well as the original texts, for meaningful and general trends in the statements and in the developments across the entries and across the semester groups.

RESULTS

The main topics

As indicated earlier, the first question in the study was about the identification of the main pre-occupations of the student-teachers with regard to their teacher-training experience. As indicated in the data summary table, the diary entries covered five general topics and 13 sub-topics. These were (1) the narratives, which were of two types: instructional accounts and class incidents, (2) the self, which included happy experiences, weaknesses, explanations of weaknesses, compensation strategies, pedagogical concerns, and learning experiences, (3) the others, and these were the pupils and the trainers, (4) the teaching profession, and (5) the curricula (the training program and ELT in the schools).

As was expected, the subjects used their diaries mainly to report the teaching-related events that were significant to them. As the summary table indicates, the most frequent kind of information in the diaries were the narratives. These fell into two major categories, namely: (1) description of activities that the authors conducted in their teaching, and (2) incidents that involved the trainee. The reflection involved in these narratives consisted primarily in selecting the events and structuring them, which is in itself a form of reflection. It is not of the same level of thinking as the more demanding and critical statements that are found in the remaining kind of information; but it is a form of reflection, nevertheless. These narratives were more common among Semester 7 students and in the earlier entries than in the later ones. Additionally, the more fluent writers tended to report fewer or shorter narratives

than the less sophisticated writers and had, by way of cause or result, more space allocated to non-narrative and critical text.

Data summary table: Frequencies and Means For the topics and sub-topics covered in the 140 diaries

Topic	Sub-topic	Semester 7 (n=10 x 5) Frequency X /Entry	Semester 8 (n=18 x 5) Frequency X / Entry
Narratives	**Instructional**	**80 1.60 96**	**1.06**
	Incidents	**30 0.60 45**	**0.50**
Self	**Positive Experiences**	**85 1.70 175**	**1.94**
	Weaknesses	**65 1.30 154**	**1.71**
	Explanation of weaknesses	**63 1.26 184**	**2.04**
	Compensation	**62 1.24 118**	**1.31**
	Pedagogical Concerns	**48 0.96 50**	**0.64**
	Learning experiences	**48 0.96 145**	**1.61**
Others	**Pupils**	**123 2.46 192**	**2.13**
	Teachers	**42 0.84 56**	**0.62**
Profession	**Beliefs**	**65 1.30 105**	**1.16**
Curricula	**Training**	**25 0.50 85**	**0.90**
	ELT	**15 0.30 65**	**0.72**

PERCEPTIONS ABOUT THE COMPONENTS OF THE EXPERIENCE

The self

a) *The "bright side" of the experience*: In some of the entries, learning-how-to-teach was described as a happy and exciting experience, rather than a stressful one. This was the case especially among the academically strong trainees and the average students beyond the first weeks of the teaching practice program. One of the stronger students from Semester 7, though she was concerned about her anxiety, expressed a strong sense of excitement and personal satisfaction with her experience. For her, the first lessons were an opportunity to experience success and enjoy recognition by others (in this case the pupils) as a professional teacher. It was a happy first encounter with the profession, and, as one of the trainees put it "a walk into adulthood". This fulfilling experience seemed to be cause enough for her to like teaching and to actually "want to be a teacher".

The positive reactions toward the teaching experience were more common in the later diaries and, even more so among those who had already had one semester of practice teaching. If they were of the stronger type, they were even

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more likely to experience these happy feelings. Having already done some teaching in the previous semester (Semester 7), and having resolved some of their initial difficulties, Semester 8 diarists were more inclined to make positive reflections about their experiences. The feelings expressed were related to: satisfaction with the progress in the quality of communication with the students (more fluency and fewer mistakes), better teaching and management skills (including those related to the initially problematic areas such as grammar and discipline control), more self-confidence, a more active interaction with the class, a more positive interpretation of the students' attitude toward the trainee teacher and, of course, the pride to be an English teacher. Some diarists developed such a level of confidence toward the end that they wished they could have the whole classes for themselves and teach as many hours as possible. One of them felt proud to be doing her Teaching Practice with the very people who were once her teachers. For her, she became their colleague and she felt she could compete with them, and that constituted for her a "special achievement".

The positive feelings were explained in terms of the learning and the increasing instances of success that were being achieved. One of the Semester 8 students summarized her development as follows:

> During this *whole semester as a trainee teacher, I have learned so much from practicing teaching. I encountered some problems, but I managed to overcome them by experience and advice from the my trainers. I can now remember myself how I was at the beginning of this year. I can notice... how my own personality has changed... I have acquired good experience and have learned different techniques for the different skills and different levels.. I have also learned many management techniques,, different methods of teaching the four skills, how to manage the time for each lesson...*

b) *An overwhelming initial teaching experience (Weaknesses)*: Of all the non-narrative materials included in the diaries, the reflections related to the trainees' emotional difficulties were the most prominent ones. Almost all the diarists described and commented on their anxieties during Practice Teaching and Micro-Teaching. This was especially the case in the earlier entries and among the Semester 7 students who were making their first teaching attempts. The emotional experience was dominated by a strong crisis of self-confidence and fear. The common adjectives used to describe

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this experience included: afraid, confused, intimidated, nervous, anxious, uncertain. The specific feelings reported under this theme were: (1) fear of not being able to face the pupils, (2) fear of failing to implement the lesson plan, (3) fear of being rejected by the pupils, (4) fear of making too many language mistakes, (5) fear of showing one's weaknesses to the pupils, (6) fear of not being understood, (7) being intimidated (in some schools) by the pupils' general level of sophistication, and (8) fear of not being respected by the pupils. Some of these anxieties are reflected in the following excerpt from the first entry of Student-Teacher 3, a female from Semester 7:

> I didn't *believe that I was going to teach pupils in a real school...I was afraid of that experience. I didn't have any confidence in myself. I was afraid of failing...Many questions came to my mind, but without any answers. When I entered the class, I asked myself: what is the first thing that I should do? How can I introduce myself? Will the students accept me as their teacher and will I be as good as their teacher?*

c) *Explanations of the weaknesses (anxieties)*: In some diaries, the fears were the object of some analysis. The main attempt made in this regard was to provide explanations of the anxieties. The most common of these explanations centered around the authors' linguistic difficulties, which were felt to be the source of their uncertainty and anxiety. The difficulties frequently mentioned included: hesitation in speech delivery, and making mistakes in grammar and pronunciation. One of the Semester 8 male students described his weaknesses as follows:

> *I have some difficulties like hesitation, mispronunciation, and grammatical mistakes. Although I prepared my lesson well and rehearsed it many times, I didn't present it in a good way.*

Another prominent weakness that was often discussed as an explanation of anxiety was the uncertainty felt about pedagogical and organizational skills, especially time management or handling discipline problems, and of course, the skills that had not been covered in the formal course-work (e.g. how to teach grammar and speaking, both of which were covered after the first round of Practice-Teaching). In this connection, Diarists 4, 5 and 6, all three from Semester 7, explained their anxieties in the early lessons as follows:

I was so afraid because I doubted my ability to teach and to manage the class...(Diarist 4). The most important problem I faced was disorganization. My lesson is sometimes disorganized because I cannot control my class time. (Diarist 5). I felt confused because I was not sure about how to teach grammar (Diarist 6).

A third explanation that was not uncommon was stated in terms of personality traits. In their reflection on their experience, some trainees found that they were shy or poor communicators. This trait was felt to generate a state of nervousness or even panic in the teaching situation. It was mentioned by males and females alike. For example, Diarist 6, a male from Semester 7, singled out shyness as one of his major problems and wrote the following:

Another problem that I had is my shyness. I mean by this that I was sometimes feeling shy when I stood in front of a class or group of people. I was so nervous...

While most perceived the above weaknesses as the main source of their fears, others felt that it was the lack of self-confidence that was the problem. Following this reflection, a low level of self-confidence caused the trainee-teachers to make language mistakes, to express themselves poorly and to feel nervous and even confused in the teaching situation. This reflection is best expressed by Diarist 9, a male student teacher from Semester 7:

An example of an important problem is "lack of confidence". This problem is essential because it affects the other aspects of the teacher's behavior. In other words,, lacking the confidence will cause other problems like making pauses, hesitation, making grammatical mistakes,...

The above explanations of the weaknesses present self-confidence as having two apparently contradictory roles: one in which self-confidence is the cause of the other difficulties, and the other in which it is the result of these difficulties. This suggests that the real relationship between the two is that of an interaction in which the two types of weaknesses affect each other and can be felt to be either a cause or a consequence.

d) *Pedagogical concerns:* The self-diagnosis did not only cover the strengths and the weaknesses; it also dealt with the persistent pre-occupations that the trainees did not seem to overcome, even after the full practice-teaching experience. The most common of these were: (1) how to avoid the pupils' use of (and demand for) translation into Arabic, (2) timing and pacing of

the lesson, (3) how to help the weaker pupils, (4) how to deal with discipline, (5) how to make the pupils more motivated to learn English, participate more in the lessons and be less exam-oriented in their learning, (6) how to deal with the master teacher's advice in the case of disagreement.. Some of these concerns are expressed in the following diary excerpts:

> *I still have a difficulty with the questions of when I can use translation and how I can help the weak students (Diarist 16). Students are interested only in the lessons that will come up in the exams. I do not know how I can change that (Diarist 15). Discipline is a problem that I have to read about (Diarist 20).*

e) *Compensation strategies and plans of action:* In their self-diagnosis, the subjects did not simply demonstrate an awareness of their weaknesses; instead, they also devoted a portion of their diary space to the description of what they had to do to overcome their difficulties. By doing this, they clarified for themselves the remedies as well as the weaknesses. In discussing their courses of action, they showed that they were in charge of their own weaknesses, rather than blaming their training program or trainers. The most common actions cited as measure to counter the felt weaknesses included: (1) extensive work on language skills through independent reading and listening in English, (2) careful preparation of the lesson plans, (3) rehearsal of the lessons to be taught before their presentation with real pupils, and (4) the continued study of the problematic pedagogical areas (consultation of methodology books). In this regard, Diarist 8 from Semester 7, elaborated on her course of action in the following words:

> *I need to read a lot and listen to English stories on the radio to improve my pronunciation. I also have to speak English with my friends. For my teaching problems, I have to talk to my teachers and read more about the teaching languages.*

Other strategies, though less common, were not as much related to the trainees' skills and knowledge. They were, instead, directed to the strengthening of the trainee's status in class. Thus, a number of trainees expressed in a variety of ways their search for belongingness in the class and their acceptance by the pupils as their teachers. Some even expressed the need for a 'feeling of intimacy" with the pupils and a relationship with their classes that did not have to depend on an intermediary (i.e. the master teacher). Thus,

while they did value the help that was provided by this intermediary, they were longing for the moment in which they could be independent and have the classes to themselves without the presence of the master teacher. The decisions or desires expressed in this regard included, of course, the determination to teach to their fullest ability, for success in teaching was perceived as desirable not only because it was a professional requirement, but because it was a means to achieve acceptance and recognition by the pupils. A decision mentioned by some trainees in this regard was to find the opportunity to have a "private talk" with the pupils through which they could establish the needed rapport. In addition to fulfilling the acceptance need, this rapport was felt by some trainees to be an important factor in class control and keeping discipline. In this regard, Diarist 14, a Semester 8 student wrote the following:

> *I felt I wanted the students to like me and to accept me as their teacher. This was important for me to feel like a real teacher... If they take me as their teacher, they will not cause me trouble.*

f) *Learning Experiences:* As reported in the data table, one of the prominent topics in the diaries was on the trainees' learning experiences. Under this topic, the diarists described and discussed the content of their learning or the manner in which this learning took place. The reflections that were reported may be classified into three categories: linguistic, procedural, and interpersonal. Within the linguistic category, the diarists identified the features of the English language that they learned as teachers. These features included (1) certain grammatical structures which the trainees were not aware of, (2) certain vocabulary words, and (3) pronunciation of certain words that were either new or imperfectly learned, and (4) fluency (hesitation-free speech). The means that the diarists mentioned for the achievement of this learning were: (1) checking the references, (2) careful preparation, (3) rehearsal (e.g. in the case of the pronunciation of difficult words like "architecture"), (4) asking the master teacher or trainer for help, and, of course, (5) extensive exposure to and use of the language (essentially through reading, listening, and speaking)

Within the pedagogical category, the diarists reported several learning experiences that were significant to them. The most common ones included, of course, new skills and information (e.g. how to teach grammar), the refinement of the procedures for teaching the different language skills (e.g. the specific details about guided composition), the development of personal ways of handling a management problem (e.g. controlling students by re-seating them),

the experience-based realization that certain aspects of teaching (e.g. the quality of visual aids, the interest of the material, or the teacher's personality or image) are critical for the success of a lesson. The means by which this learning took place were hands-on experience (learning by doing), trial and error, self-regulated combination of study and practice, feedback from trainers, and most interestingly, discovery and sudden awareness. Some of these learning devices are described by Diarist 22 as follows:

> *Learning things about teaching requires practical experience. Studying ideas and techniques in the lectures is helpful, but it is not enough for me. I have to practice... I keep trying an idea until I get it right. Sometimes, an idea comes to my mind while I am teaching... My teachers help me but I cannot rely on them..*

The interpersonal type of learning experience is the one which has to do with the relationship between the trainee and the pupils or among the pupils themselves. Some of the learning achieved within this category centered around the requirements for the pupils' cooperation with the trainee and their acceptance of him/her. These requirements, according to some diarists, included showing interest in the pupils as individuals, friendliness toward them, establishing a rapport with the class, in addition to effective teaching. The interpersonal learning also deals with the social conditions in the classroom which generate active participation in the lesson. A common reflection in this regard was that creating competition among pupils was helpful in encouraging this participation.

One of the important features in both the pedagogical and interpersonal experiences was that the trainees demonstrated a noticeable level of tentativeness and uncertainty in their learning. This was especially the case among the more advanced and more proficient diarists, especially if these were females. Not only did the diarists use in their reflections the language of tentativeness (I think, it appears..), but they also tended to question a good part of their new learning. They ended many of their entries on a happy note with a statement on what they were sure of, only to express, in the next entry, their uncertainty about many aspects of teaching, including the very aspects they thought they had mastered.

The others:

Although the diarists allocated most of their writing space to themselves, they did include reflections about the others, especially the pupils. In the early

entries, almost all the reflections were made about the self, and very little was said about the others. As the student-teachers advanced in their training, they became more cognizant of the others' actions and roles in the training experience. In other words, there was a noticeable move away from the self towards the others, from the ethnocentric topics to the class-based topics. They gradually became more inclined and more able to make diagnostic reflections about their pupils, with a particular focus on the weaknesses. They also showed interest in the unfortunate discrepancies between the strong and weak students in the class, and the need to attend to the problems of the latter; in so doing, they demonstrated a noticeable sense of fairness. For example, after she had resolved her main personal anxieties, Diarist 16 (from Semester 8) expressed the concern that the weak students in her class were not benefiting from the lesson, and so decided that she was going to give them more attention. Most important, though, was the fact that the trainees became increasingly sensitive to the critical role that the pupils were playing in the success of their work. When a lesson was successful or unsuccessful, this was often explained –at least partly—in terms of the students' behavior (level of participation and interest, etc.). However, this was more noticeable among the weaker trainees. The stronger ones were more inclined to include in their explanations aspects of the teaching that were teacher-based.

The trainers, who included the academic faculty and the master teachers, were not totally absent in the diaries. However, they seemed to have a less important place in the training experience. The role of the academic faculty—when described–was that of simply providing guidelines for Micro-Teaching and Practice-Teaching. When the master teachers were mentioned, their roles seemed to consist primarily in allowing the trainees to observe them once or twice, providing occasional advice or in calling the students' attention to some established rules related to the teaching methodology. This "call to order" was in some cases a source of frustration for the trainees. Having learned a variety of teaching principles and techniques in the theoretical courses, the trainees were inclined, in the upper semester, to choose more or less freely the techniques to use in their classes. Sometimes, these choices met with the disapproval of the master teacher and led to some form of conflict. One of the more advanced trainees felt frustrated about the authority of the master teacher and the lack of opportunity for her to be creative and to bring material of her own. She expressed her impatience to have her own class so that she could explore her own ideas about language teaching, without anyone's intervention. She expressed this frustration as follows:

I am so frustrated in my teaching now. I have so many plans and lots of ideas that I want to apply, but then I can't do any of that now. I have to wait until I get the freedom in my real school, with my own classes. During my practice teaching, I have to limit myself to the textbook... The cooperative teacher prevents me from doing what I want.

The interaction with teachers was not limited to the master teachers. It also involved other teachers in the school where practice teaching took place. These teachers seemed to play almost no role in the trainee's experience in the early stages; however, in the later stages, they became an important medium for the trainees' socialization into the teaching profession and for their admission into the community of teachers. Not only were these teachers providing informal advice and information on how to "get things done" in the school and "how teachers deal with each other", but they were also extending "approval" and "acceptance". One of the diarists in her last entry expressed her happiness that the teachers were talking to her "like a colleague" and that gave her the feeling that she "had become a real teacher".

The teaching profession:

Most of our subjects allocated a significant amount of diary space to reflections about the teaching profession. These reflections, which were stated in the form of personal beliefs at the beginning of the entries, highlighted three important themes. The first related to the important role of education in society. Under this theme, the diarists described teaching as a "special mission" and as a critical and difficult "social responsibility", in which the teacher is a "role model" for the pupils. The second theme related to the requirements for a teacher to be successful in his/her mission. Among the requirements frequently mentioned were: strong personality, hard work, patience, love for children, general knowledge and foreign language ability. The third theme was about the benefits of teaching, which, according to some diarists, included: social respect, moral satisfaction, and the privilege of influencing others. In presenting these beliefs, the diarists showed a noticeable level of idealism about the profession, which did not seem to weaken with the passage of time and which was common among males and females alike. The three themes are all exemplified in the following excerpts:

Teaching is the ideal job for me. To be a teacher is a great responsibility in our society. You have to give a lot of yourself to your students... You have to make sure that you are the right

model for them. (Diarist 7). Teaching a foreign language requires a lot of knowledge and certain skills. It also requires a strong personality... (Diarist 9). In teaching, you become a respectable person in your society (Diarist 12).

The Curricula

A number of the diarists' reflections centered around the curricular of both the training program and the English language teaching (ELT) in the schools. Regarding the training, some aspects of the program were found to be helpful, and these include the micro-teaching experience and the content of the methodology lectures. However, concerns were expressed about the "reality gap" between the content of the course-work and the actual teaching in the real school setting. The feeling was that the course-work should serve the sole function of preparing the students for practice teaching. The sense of immediacy and the pressure for adequate performance in the classroom were strong and therefore very little credit was given to the long-term goals of the theory courses or to the larger educational issues that are covered in these courses.

As would be expected, the diarists made a number of recommendations about the training program. These included the need to make the training more directly relevant to teaching, the increase in the number of observation sessions before beginning the actual teaching, better micro-teaching conditions (fewer trainees per session), more time for practice-teaching and fewer trainees allocated to each school.

The ELT curriculum was also the object of the diarists' reflections. One of the general generalizations that may be made about these reflections is that some of the stronger students tended to become more critical as they were advancing in their experience. The average trainees did not show such a development in their attitude. The most common critical statements made about the ELT curriculum revolved around the unchallenging character of the material and the low level of thinking required from the students. The criticism was also levelled against the lack of teacher's independence in using the material (little room for teacher creativity) and against the exam-oriented practices in both the teachers and students' work.

Conclusions and implications

On the prominence of narratives: In discussing the relative prominence of narratives vs. critical reflections, two important points come to mind. The first

has to do with the explanation of the tendency of the diarists to include more narrative texts in the early entries and more critical texts in the later entries. This tendency can perhaps be explained by the fact that, in the early stage of their training, student teachers have a special preoccupation with the procedural aspects of teaching and are more focused on methodology, and as a result devote a lot of their diary space to the step-by-step description of their teaching. As the trainees acquire more teaching experience, the teaching procedure gradually becomes a less pressing need, and their confidence in making reflective statements becomes greater. This is consistent with observations made by previous researchers. For example, Ryan (in Rust, 1994) pointed out that beginning teachers focus on "front stage" behaviours of teaching, that is the behaviours that are obvious and important to them and to their observers and readers (in this case their trainers). Similarly, Ball and Feiman-Nemser (1988) reported that beginning teachers tend to focus on how to establish management and instructional routines. Although the teachers described by these authors are in their first year of teaching, rather than pre-service trainees, they are nevertheless still novice teachers, like the subjects described in the present study.

The second point is about the tendency of the more fluent diarists to allocate more writing space to the non-narrative material. This tendency is not surprising, for diary keeping is essentially a writing activity, and is therefore largely affected by the diarist's writing ability which is itself defined not only in terms of accuracy, the use of the right language forms (vocabulary and grammar), but also in terms of content, of which the sophistication of thinking is an important component. The inclusion of more critical information in the entries is a reflection of this greater level of sophistication.

On the nature of the experience: From the results above, one can draw some generalizations about the experience of the undergraduate EFL student-teacher. One of the important characteristics of this experience is that it involves, in the earlier stages, a complex combination of positive and negative emotions which interact among each other as well as with the daily events of the training. Not only do these emotions color, and are colored by, the trainee's perceptions of the elements and the events in the teaching situation, but they also affect, and are affected by, the trainee's behavior. Included in this emotional mix are the excitement about the new experience and feelings of growth and pride that are associated with it. But more prominent are the feelings of stress, fear, and frustration. Clarifying these emotions and trying to manage or dominate them seem to be a major concern for the EFL trainee

teacher. Struggling to improve the emotional conditions by overcoming the linguistic and pedagogical weaknesses – which are a major cause of stress– is an important goal. Achieving the psycho-social goal of "belonging" with teachers and especially with pupils is also a major preoccupation. Thus, as McNally et al. (1994) observed with their Scottish practice teaching students, the primary pre-occupations of our EFL pre-service student-teachers are – in the early stages – affective, rather than cognitive, emotionally-oriented rather than knowledge- or skill-based.

A second characteristic of the experience is that it is driven by pre-occupations with the trainees' immediate needs. In addition to the concern with teaching anxiety –or as a part of this anxiety – EFL trainees seem particularly interested in the issues that have immediate and observable consequences. These issues are of two major categories: linguistic and pedagogical. Within the first, the trainees are concerned with the quality of their English and the language errors that they are likely to make. Within the second, they are concerned with the technical aspects of a language lesson such as the use of translation, timing, class control, class coverage (especially attending to the weaker students), to mention only the important ones. These are the aspects that have immediate relevance for the perceived success or failure of the lesson. They are what Ryan (in Rust, 1994: 205) would describe as the "front stage" behaviours, because they are more directly observable by the trainee her/himself or by the observing trainer. Given the level of their professional expertise, our subjects cannot perhaps be expected to exhibit higher-level concerns, what Rust (1994: 216) refers to as the "backstage behaviours of teaching", which would include, in our context, the philosophy and the goals of teaching the foreign language, the place of the EFL curriculum in the general school curriculum, the competing demands on teachers' time, the place of authority in school and class management, etc. Thus, the reflections demonstrated by our EFL trainees are of the type that the critiques of reflection (e.g. Hatton and Smith, 1995) would call the "first level of reflection" or "technical" reflection, that is the thinking concerned with "the efficiency and effectiveness of means to achieve ends" (Hatton & Smith, 1995: 35). Absent from these concerns are the higher-levels of reflection, which include "practical" reflection (the examination of goals, the assumptions behind them and the outcomes achieved), and "critical" reflection, which represents the highest level and involves, in addition to all the rest, the thinking about the ethical and philosophical issues (ibid.). Whether these higher-level issues should be a part of a pre-service EFL teacher training program in all contexts is an open question.

Another characteristic of the EFL trainees' experience is that it involves important and fast changes. Thus, the dominance of the affective concerns, does not apply to the whole experience to the same degree. Among other things, although the affective concerns are obvious in the experience as a whole, changes in their intensity do occur over time. As the trainees resolve the affective issues and are more at ease with themselves and their environment, they become more cognitively-oriented in their concerns, more interested in the pedagogical issues and even more critical of the current practices. This is especially the case with the stronger trainees, who seem more able to resolve the affective issues and to overcome their weaknesses earlier and more quickly than the weaker ones. The changes also occur in the role of the "others". In the early stages of training, the focus seems to be on the self. Gradually, the pupils come into the picture: their attitudes and behaviours become of paramount importance, because they provide the trainees with important feedback about their adequacy as teachers. As Su (1990) and Brtizman (1986) have argued about their respective subjects, our EFL trainee-teachers show a high level of dependence on their students for their sense of satisfaction and judgment of their teaching effectiveness. The role of the master teacher, though certainly instrumental in getting the trainee acquainted with the class, is not as obvious, not even in the early phases of the training. The school teachers, as a group, become an important agent for the trainee's "socialization" into teaching only in the later phases of the training. Thus, contrary to McNally et al (1994) who found that both mentors and pupils were a major source of beginning teachers' self-perception as teachers, our data suggest that the master teachers' role in the trainees' experience is not as critical as the students'. Not only does it seem to come late into the trainee's experience, but, even when it does, it is not as important as that of the pupils.

On the basis of the above characteristics, the successful initiation of the undergraduate EFL student into "teacherhood" seems to consist of six general and somewhat interdependent stages/components: (1l low-intensity induction (lectures and micro-teaching), (2) high-intensity induction, (the pre-practice teaching observation), (3) resolving the emotional difficulties, (4) skill learning, (5) local belonging (class-level acceptance), and (6) wider (school-level) belonging.

Implications: The results of this study have some important implications for the undergraduate training of EFL teachers. The most important of these are: (1) the need to attend to and accommodate the student-teachers' needs which are not only pedagogical, but also linguistic (limited language proficiency) and

affective (confidence and anxiety problems), (2) encouraging the trainees' use of compensation and learning strategies, and (3) making the coursework more relevant to the teaching situation.

As we ca see from the above results and discussion, diary writing is an important tool in the training of EFL student-teachers. They provide them with the opportunity to use their reflective resources in order to perform a number of important tasks. Among these is the self-diagnosis, which includes the identification and clarification of weaknesses and, especially, the fears and anxieties that they are experiencing as teaching apprentices. Reflection also includes the making of decisions about the course of action to take in order to overcome the weaknesses and adverse emotions. Another task that is performed through reflection is the evaluation, albeit elementary, of the ELT curriculum administered in the schools, which helps the trainees gain a clear understanding of the material that they will work with as teachers. But most important than all is the fact that reflection through diary writing leads student-teachers to sharpen their awareness about classroom processes and their ability to monitor these processes. In addition, the activity is a valuable opportunity for the trainees to engage in regular, meaningful, authentic, and experience-based writing, which inevitably strengthens their still developing EFL proficiency.

The benefits of using reflective diary writing in foreign language teacher education can be maximized in a number of ways, for example, through pre-writing discussions and the trainee's first study of his/her own diary (see for example, Numerich, 1996). It is only through reflection that trainees can develop the so badly needed attitude that teacher development is an unending process of self-regulated, personalized and reflection-based learning, and not a matter of approximating someone else's skills.

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The Role of Teacher Education Institutions in Qualifying Teachers for Technical and Vocational Institutions in the Sultanate of Oman

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ABSTRACT

The intention of this study is to offer an analysis of the existing system of teacher education in the Sultanate of Oman. The study will also investigate new trends and models developed to qualify teachers for Technical/Vocational Institutions, since the existing Teachers Higher Education Colleges direct most of their efforts and programs to prepare teachers for different levels of (general) academic education.

The majority of teachers in Technical and Vocational Education enter the profession without recognized initial training qualifications. The study provides suggestions to help design and implement a program appropriate for qualifying this category of teachers. The study will examine a line on the possibility of coordination between the Teachers' Higher Education Institutions and employing Institutions to produce enough graduates who are competent to deal with the changes, particularly the revolution in Information and Communication Technology and to satisfy the labor market's needs.

Introduction

More than ever, national development depends on qualified and skillful nationals. As modern societies undergo economic educational change, efforts have been made to make vocational training more adaptable to such changes. Steps are being taken to add a community dimension to education, in particular to initial vocational training. There is better access to information on the changing situation of the labour market, training opportunities for young people have increased as there has been an increase in the number of programs aimed at promoting creativity, initiative and the spirit of enterprise in young people.

In general, many countries have tried to raise the level of education and training and improve its quality, as well as diversify training provision, whether it be for the students or the teachers and trainers involved. The current trends regarding developing technical vocational education have evolved because the number of young people that continue in general or vocational and technical training has significantly increased. In some countries, the number of students who pursue vocational education is higher than those who opt for general/academic education. For example, in Germany', almost 80% of young people opt for vocational training and only 20% continue in general or university studies. On the contrary, in the UK the majority of young students 80% continue in general education while only 20% receive vocational training on-the-job. In the Gulf Arab States the situation is similar to the UK, where the majority of young students opt for general and academic university studies.

In the case of the Sultanate of Oman, the development of education since 1970 has led to the reduction of illiteracy among the national workforce. However, the majority of educated people prefer to take on administrative jobs rather than skilled and semi-skilled jobs even if they are qualified to do so. The out-put of technical/vocational education institutions do not contribute positively to satisfy the labour market requirements. It has been officially realized that only 1.3% of the total out-put of secondary education graduates came from technical education, while the percentage of students graduating from general secondary schools is 98.7%, (the total number of students at this level was 69240 according to the general census statistics of 1995-1996)[2]. The number of young people opting for academic studies or vocational training determines the number of staff employed in each sector. The number of teachers or trainers is also affected, whether the vocational training is carried out mainly in educational centers or in companies or in specialized institutions.

Additionally, the nature of courses and programs, in the long run, will affect the qualifications of teachers required to teach.

This situation is apparent in Oman because the recent policies of education and training puts emphasis on preparing and qualifying young people to participate effectively in the labour force. To implement these policies, there is a need to supply the emerging institutions with professional teaching and training staff. Consequently, more attention is required to focus on preparing teachers and trainers for this sector of education and training. In Oman, the majority of teachers and trainers are non-nationals and the Omanis lack the experience in teaching in the field of vocational education because many of them are employed without previous professional experience. In the context of the government's efforts and trends to improve vocational/technical education and training, the initial training of teaching staff and trainers assumes a strategic position.

In recent years, there has been a training revolution. New requirements in the field of economic development and competitiveness have put training and the need for suitable skills at the forefront of reform to cope with the technological changes in many societies. By 2025, Japan will have a population with one of the highest number of over 65s in the world[3]. Therefore, more attention is placed on adult and continuous education programs. In contrast, Oman has a population with almost 50% under the age of 25. Therefore, attention must be directed towards the role of vocational education in compulsory education, post-secondary education and the growth of private sector provision in non-formal education and in-service and pre-service training.

The emergence of newly-industrialized countries means that economic growth by the end of the 1990's is likely to be slower. Unlike the UK and USA, where international competition has put pressures on the youth labour market, the Omani employment system continues to face the burdens of an unqualified national labour force. However, more attention has been directed towards the adoption and implementation of various policies for educating and training young people who have not succeeded in winning a place at university. Consequently, this has led to the need of educating and training teachers for vocational education which has progressed considerably in the last five year, in terms of its aims, programs, contents, institutions and student numbers, particularly at the post secondary level.

Teachers in most countries work in technical and vocational training schools or centers, and become specialists mainly as a result of their education – through university or university – related studies. In some cases, they may lack

previous professional experience in the relevant sector, being strong in theoretical training, but perhaps weak in hands-on experience. In other cases, for example in the UK, industrial experience is the norm, although it may only be very recent experience among the newly appointed.

The present Omani Educational System faces what we call internal pressure which can be identified as tensions emerging from the internal and external dynamics of the present system. For example, the intensity of the competition for university entry has been widely thought to damage personal growth, child development, the encouragement of the creativity of many of them – their families caught up in such competition – and to be an impediment to a more varied curriculum. As a result, there is a link between examination pressure and the weight attached to educational certification which is a pre-requisite to be admitted to university. It is possible that perceptions of change in the wider society and economy will reinforces these internal and external pressures for change, since they add to the call for a more diversified system of education and training which can respond in a more flexible way to one's individual needs.

The structural changes in the Omani economy and the emergence of new sectors means that knowledge and skills acquired within general education and post-secondary education or initial training cannot suffice for a working life. These changes reinforce the need to introduce development in education programs and initial vocational training for students and teachers. Many economic sectors are coming to recognize the need for a stratum of technicians to fill the vocational gap between graduates and skilled workers because of the spread of microelectronics in the machinery industry and the growth of the software industry. Moreover, targets for training in Oman are not just initial trainees but also in-service workers.

In order to assess the present situation, few studies have taken place to investigate how teachers initially are prepared to be able to teach at vocational/technical schools. However, there is a common feature among developed and developing countries which can be seen and identified as a shortage of qualified vocational/technical teachers. Therefore, the present study will focus on and investigate such problems by answering throughout the study the following questions:

1. What are the changes facing Omani society that affect the teaching profession?
2. What are the conditions influencing education in Oman?

3. What is the provision for qualifying teachers and trainers for vocational/technical schools and institutions in some selected countries?
4. What are the proposed solutions and suggestions for qualifying and training prospective vocational/technical teachers which can be adapted for the present educational system in Oman?

The present study focuses on the analysis of data related to vocational/technical teacher education at the national, regional, and international level from the international perspective, to register the facts and trends facing initial vocational education for teachers. In addition, suggestions will be drawn from the analysis; in particular a solution will be advanced for initial vocational/technical teacher education in Oman.

The next section highlights some specific terminologies and definitions which will be adopted for the present study:

DEFINITION OF TERMS

Teacher

Those people who are responsible for or who run initial vocational training courses whose objective is to provide skills training or further education to young people (aged 15-28) who have completed compulsory schooling. The term teacher in vocational training and teachers in initial vocational training are used imprecisely to refer to two large occupational groups: the teachers who work mainly in technical or vocational institutions, and the trainers who work in firms or in non-academic training centers[4].

Initial Vocational Training

It is any form of non-university vocational training, including technical and vocational training and apprenticeships, which provides young people with the opportunity to obtain a vocational qualification recognized by the competent authorities of the Member State in which it is obtained[5].

Studying cases of teachers education in some countries, mainly industrialized countries, reveals that technical and vocational training in most countries is usually conducted in technical and vocational training schools or centers, and they become specialists, mainly as a result of higher education – through university or university-related studies. In some cases such as in Oman, they may lack previous professional experience in the relevant sector. Being strong in theoretical training but lack of hands-on experience is the norm. Generally, higher education is not the main route into technical and vocational teaching in many countries.

The following section will concentrate on identifying trends in teacher education and the concept of Omanization in Oman and its influence on implementing policies of education in general.

Trends in Teacher Education

In general, three trends were evident in the educational changes in the post war era[6].

- The expansion of educational opportunity.
- The diversification of what education could offer and delivery systems.
- The continuation of a growing demand for post-obligatory secondary education.
- Further expansion and modernization of teacher training programs.
- The continued extension of formal systematic didactical training as a requirement for appointment to a teaching post.

These trends by the late 1960s were to have an impact on teacher education, and some major issues achieved particular prominence:

a) The lack of consensus in the teacher education community on what has been termed a "Technology of Teacher Education".
b) The reassessment of the life-span of teacher education.

In the light of changing roles of teachers in all societies, the knowledge expansion of curricula at all levels of education and the need for upgrading the present qualifications of the teaching profession in the majority of nations around the world, the initial preparation of teachers is inadequate. As a result[7].

a) The participation in the decision-making process for teacher education must be broadened. As education becomes more involved in the achievement of broad social goals, more sectors of society with a stake in the outcome should play a more significant role.

b) The success of a teacher education program is defined by the competency of the education personnel it produces. The competency based issue has given new life to the perennial concern for linking theory and practice in teacher education.

The trends related to consensus building in theory and policy are capable of providing a solid foundation for the reappraisal of the existing form of institutions for teacher education in Oman, show marginal accomplishment in terms of pre-service education for teachers recruited in technical and vocational institutions, whether at the secondary or the post-secondary level.

Omanization and Demands of National Manpower

The issue of Omanization came into being with the publication of Oman's third National Development Plan (1980-1985). Theoretically, it means the replacement of expatriate labor with similarly skilled, trained and educated Omanis. In practice, it remains a distant goal for all Government agencies, public corporations and private businesses. Omanization, according to public agreement, means to fill the job requirement with efficient and competent Omani nationals, to fulfill organizational needs. Such a policy has been seen as a counter measure to the unpopular importation of foreign labour, so necessary to the development of the Sultanate infrastructure.

In Oman, the present concern appears to be more directed towards the need for a commitment to the creation of a system of continuing education and training for adult workers, as well as students in the formal educational institutions. The need to improve the quality and flexibility of the Omani labour force gives a critical role to the vocational education and training policy. This policy is supposed to be supported by a system and programs to prepare teachers to implement this policy. Many problems which current policies aim to tackle have been identified during the last two decades. Among these problems are[9]:

a) The lack of trained national manpower
b) The imbalance between the number of national and non-national labourers in different sectors of the economy, particularly the productive and services sector.
c) The low level of education among the national workforce at large.
d) The majority of young people do not carry on an education after 16-17 years. This means that they are not as accustomed to, nor as well prepared for, the continuing education and training which is an increasingly important feature of modern economic demands in Oman.

The Ministry of Social Affairs and Labour has conducted a study concerned with the demands of occupations in different sectors n the Sultanate of Oman. This study is based on the Fourth Five Year Plan (1991-1995), in addition to the predictions for the demands of occupations till the year 2000. The study classified the demand of labours into the following categories[10].

1. The annual average demand in scientific and technical specialists is 2560 for the year 2000. The large number of this class is represented by engineers and accountants. This class contains specialists in the sciences of physics, chemistry, astronomy and the technicians related to them;

engineers, sculptors and the workers related to them; engineering technicians, and designers; pilots, marine officers; specialists of the sciences of biology, the doctors and the occupations connected with medicine; photographers, artists and journalists. This class represents the technical, scientific and managerial leadership of Omanization. The study states that it is possible to plan to provide such specialists through the Ministry of Higher Education represented by S.Q.U., and the Supreme Committee of Vocational Training represented by Oman's industrial and technical colleges and centers.

2. In terms of clerical and non clerical jobs, the average demand is 701 for the year 2000. This class contains typists, cashiers and the operators of telephones, telegraph and fax. It is planned to provide such occupations through the institutes of training which can contact the establishments and companies of the private sector to meet their needs.

3. Concerning professional workers and production supervisors, the average demand is 4619 for the year 2000. The large number of this class is represented by tailors. It also contains mine workers, cooks, workers preparing cigars, carpenters and labourers related to them. The M.S.A.L. has opened several training centers in different places in Oman. These centers are concerned with training students in the arts of sewing and the duration of training in such programs is one year.

4. The annual average demand for 2000 within the class of machine operators is 6221. This class contains shoes and leather product labourers, workers in the wood and furniture industries, miners, workers in fixing electrical instruments, operators of sound and cinema machines in the media and workers in glass products.

5. The average demand for 2000 within the normal worker class is 12981. This class involves workers in the plastic and rubber industries, paper and carton products, printing workers, photographic printers, structure workers and drivers. It is suggested that employing Omanis in these jobs will prop up the plans of Omanization in the establishments and companies in the private sector.

Efforts to expand the education system and develop training and continuous education requires qualified Omani teachers who are competent to teach at different levels and in different subjects. Oman faces teacher shortages especially in the sciences, technology and, in particular, in technical and

vocational courses and its specialization, because the existing Teacher Education Colleges provide education and training only for those who intend to join the general and academic schools and institutions. Oman is still lacking a coherent national education and training system for Omanis who intend to join technical and vocational institutions. The absence of such a system has forced the Sultanate to depend on expatriate teachers and trainers to teach and train students at these institutions.

Teacher Education in Oman

Analysis of teachers education in Oman highlights many different changes in the system. In order to understand these changes, some issues will be discussed as follows:

The Historical Background of Teacher Education

In 1970, when sixteen primary schools were opened, the Ministry at the time had two options to solve the problem of the acute shortage of teachers. The first option was to appoint any Omani who had the desire and ability to teach to work as a teacher. A primary level certificate was considered sufficient qualification for any Omani who joins the teaching profession. In the first academic year, 151 Omani teachers were appointed by the Ministry of Education. Some Omanis who, during the early seventies studied in other Arab Gulf countries at preparatory and secondary levels, returned to Oman to join the teaching staff[11].

The second option was adopted in 1972 when the Research and Development Department was established in the Ministry of Education. Its first duty was to accommodate the new teachers in their new jobs. With Arab and world cooperation, it opened, in the same year, some in-service training centers in a number of big cities. Around 261 teachers were selected to follow a training program that was based on one to two sessions a week of various duration: i.e., one year for those who possessed the secondary certificate and two years for preparatory certificate holders[12].

In an attempt to Omanize teaching positions in elementary schools, the Ministry of Education established, in 1976, the three-year teacher training centers for students who are holders of preparatory certificates. In 1980, the Ministry upgraded these centers by admitting students who are holders of the secondary school certificate. The duration of that program was one year of in-service training. The total number of teachers who graduated from these centers were 2,521[13].

The program was based on daily traditional lectures with afternoon

teaching practice. More emphasis was placed on theory than practice. Most of the text books used were the same set of books used by the hosting secondary school. These centers continued to accept students until 1983/84 when they were phased out.

In 1984, the Ministry of Education established two Junior teacher education colleges in which primary school teachers specialized in classroom and subject matter teaching. The duration of this program was up-graded further from one to two-year post-secondary education in order to improve the quality of primary school teachers. By 1990, the number of these colleges reached nine, distributed in the various provinces, till 1993. 6,207 teachers graduated from these colleges. Finally, 1995 witnessed the almost Omanization of primary school teaching posts in most provinces of the Sultanate[14].

The policy of pre-service training and qualification of Omani teachers has gone through many phases. Most efforts have been directed to qualify teachers for general academic education and to teach mainly theoretical subjects. Teachers who are appointed at technical/vocational schools and institutions do not go through the same kind of training. They are appointed according to their pure specialization in areas related to the programs and courses offered at these institutions.

It seems more sensible while we are approaching the fifth five-year plan (1996-2000) that the Ministry of Education reviews the situation of intermediate Teacher Training Colleges and begins developing them in line with modern international trends, educational requirements and goals in the Sultanate of Oman.

The Ministry believed that the up-grading of these intermediate colleges into universities, where the study period would be four years, would prepare a generation of Omani male and female teachers to be competent and efficient in their profession.

The Ministry of Higher Education contributes towards the promotion of such policy and objectives by increasing the enrollment rate of the Colleges of Education and Sultan Qaboos University, and establishing the concept of Omanization and keeping it as an important criterion for employment at all levels of educational institutions.

Manpower training is an important part of the enhancement process and it is at the top of government policy. It was one of the most productive investments a country could make. The number of nationals in the modern private sector is

very small. They account for 10% of the total employment of 305 thousands workers in that sector. The on-the-job training should not only cater for upgrading workers in their skills, but also to replace expatriate workers. The government, in an attempt to encourage the training of Omanis, has forced the employers in the private sector by law to train Omanis or participate financially in vocational training schemes by paying a training levy[15].

In spite of the changes in emphasis and the increased number of graduates in teaching different subjects, imbalances remain to highlight the manpower situation in education institutions. Teachers are still in short supply at general secondary level and technical institutions. Most of these depend heavily on expatriates since sufficiently qualified and experienced national teachers are limited in numbers. The Teachers Training Institutions are required to develop programs to qualify teachers for these institutions in order to Omanize the teaching staff.

New policies and development of plans have been thought of in order to over come such obstacles. This development began in the school year 1995/1996 – (The first year of Fifth-Year Plan).

The development is based on a number of reasons; the most important of which are[16].

1. Unification of sources of the preparation of teachers regardless of their different placement in elementary, preparatory or secondary schools.
2. Upgrading and training of elementary schools teachers.
3. Finding other sources for the training of preparatory and secondary teachers during the coming years, in addition to the College of Education and Islamic Studies of Sultan Qaboos University.
4. Upgrading the level of teaching scientific subjects (Sciences, Mathematics and Technology) in both elementary and preparatory schools so as to keep pace with the Ministry's policy, by improving the quality of education and keeping pace with scientific progress.
5. Benefitting of the human and financial resources allocated for the proposed colleges in training male and female teachers and holding different courses and educational workshops at regional levels.

In 1994, the government approved a request from the Ministry of Education to increase the duration of the colleges from two to four years so as to become university colleges. These colleges will also be responsible for preparing, in addition to primary school teachers, preparatory and secondary school

teachers. As a first step towards upgrading these colleges, the Ministry in 1994, converted two junior colleges to university colleges, one in Nizwa for men and the other in Al Roustaq for women. These colleges will offer a Bachelor's degree in Education. It was agreed that specializations such as English teaching, Art Education, Art Education, Physical Education and Home Economics will be taught only in the College of Education and Islamic Sciences at Sultan Qaboos University[17].

To tackle the problems related to the technical/vocational teachers' education, it is worth investigating some systems where initial training is formalized and developed to face the emerging demands of these societies. Therefore, the following section will focus on the initial training and education in Germany, UK, Spain, Saudi Arabia and Bahrain.

INITIAL VOCATIONAL EDUCATION AND TRAINING IN SELECTED COUNTRIES

Initial Vocational Education Teachers in Germany

In general, teachers at vocational institutions qualify to enter college or university if they attended a grammar or comprehensive school. Before beginning their study at the university, they must undertake practical experience for several months or undergo vocational training. Teachers at vocational schools are responsible for the educational part of vocational training. Two groups can be identified[18].

a) Teachers teaching theory and general job-related lessons, who have the title of 'senior grade teachers for theoretical training at vocational schools'.

b) Teachers teaching practical lessons (e.g., in school workshops, builder training yards, business training offices, school kitchens, laboratories, demonstration workshops, who have the title of "practical training teachers in the vocational education system".

As a rule, teachers at vocational school – like teachers at other kinds of schools – are permanent civil servants. Their training and careers are determined by the State training and career guidelines. The Ministry of Education and Cultural Affairs has attempted to ensure conformity in the training of teachers. The aim was to standardize the training of teachers at vocational schools which in the past had been geared separately towards five established areas (industrial and technical, domestic science and nursing, agriculture, commercial).

The framework regulations envisage teachers who have successfully completed a course of studies leading to an upper secondary level teaching appointment being employed in the vocational education system. As of 1994, they can choose between the following subject areas: metalworking, electrical engineering, construction, graphic design, design, textiles engineering and clothing, biological engineering, chemical engineering, economics, administration, dietetics and domestic science, agriculture and horticulture and social sciences. These subject areas are adapted to the needs of the labour market and are supplemented by specialized subject fields as part of an in-depth course of study, such as production engineering as part of the subject area of metalworking.

These courses of study have a theoretical bias and are generally supplemented by a general subject as well as by additional compulsory studies in educational science. Although these are university courses, the final examination (First State Examination) is the responsibility of an examination committee of the education authority. This is then followed by a two year post-qualification practical training period comprising supplementary seminars, and supervised and non-supervised lessons. This practical training period falls within the responsibility of the education authorities and does not form part of the university or college training.

The qualifications required for teaching at the vocational institutions to become senior grade teachers are competency in teaching two subjects – one often general and the other occupational or technical – within the German system of dual vocational training. They are responsible of educational training at the vocational schools. The qualifications for a teaching appointment of this kind is a course of study followed by an examination for a senior teaching appointment and a two year post-qualification teaching period. Acceptance for a place at the university or college depends on a general university entrance qualification and practical experience lasting several months in vocational training.

At almost all colleges and universities, teachers have to obtain a teaching qualification in subjects for which there is no academic course of study such as product analysis for retail traders. A teaching appointment at a vocational school presumes sound technical knowledge and very good pedagogical, methodological and didactics skills. The teacher must be capable of imparting knowledge of sciences relevant to the subject being taught to the trainees (technology, natural sciences, domestic sciences) in a manner that is both vivid

and comprehensible. Precise information on vocational practice is also required to enable the teacher to draw on the occupational experience of trainees and to assess the practical impact of the vocational theory that is being taught. In addition, a vocational school teacher must be aware of all times of the state of the art and occupational experience in the subject he or she is teaching, and be up to date on the latest teaching methods and resources[20].

Concerning teachers giving practical lessons, they have to have a "Realschule" leaving certificate or its equivalent and a vocational training qualification. In addition a master craftsman's certificate or a training college qualification must be obtained (such as graduate engineers). In addition, they should have, at least two years occupational experience followed by practical and theoretical training. Their main task is to supplement the vocational training and work carried on in the enterprise and to instill in the trainees the necessary technical knowledge and skills. In addition to this task, they are involved in carrying out and preparing experiments as part of or as a supplement to theoretical lessons.

Practical training teachers require excellent technical knowledge as well as practical pedagogical and psychological knowledge and skills. They are expected to use teaching methods that are related to economics and technical matters. They must also be up to date in the latest development of technology and practical demonstration related to it.

Initial Vocational Education Teachers and Trainers in the UK

The administration of vocational training in the UK is decentralized. Teachers training programs for vocational training depend mainly on in-service provision and employers are required to provide their lectures with training opportunities within the constraints of a fixed budget.

In the UK, higher education is not the main route into vocational teaching and is less common especially among the more mature teachers in further education. Full-time trainers are specialized in one field and have solid company experience. They have changed their original occupation and essentially work as trainers. Their strength lies in their knowledge of their special subject and their weakness stems from either a lack of training in teaching techniques, or from a possible lack of practical experience as a result of a lack of contact with the rest of the workforce[21]. Part-time trainers and temporary trainers specialize in one subject, technique or method which constitute their main professional activity, and only carry out teaching or

training projects as a secondary activity. Their weak point is that they frequently lack the teaching skills required to plan and organize the course content and adapt it to the group they are training. They often work in continuing training.

There are studies and surveys carried out in the UK to investigate the qualifications required for those who are responsible of on-the-job training, for example: a postal survey combined with personal interviews in 25 companies showed that there were variations between companies, but the study identified three types of trainers which were labeled[22]: managers of training, supervisor trainer and worker trainer. Managers of trainers were responsible for conducting an overview of company training, coordinating training and arranging-off-the job direct training. There was a tendency for these to be a youngish group of professional trainers and managers whose own background was more in training rather than in industry. Manufacturing sector managers were more directly concerned with the young trainees. A possible explanation for this was that the program for young people in this sector was usually of longer duration. Supervisory trainers were more directly responsible for the co-ordination, design and delivery of individual's training programs. Some undertook direct training themselves, whereas others delegated this to trainee workers. These supervisors were of all ages but in all cases had an industry-specific background and have moved up to take responsibility first for the work of other staff and then for their training.

Few had any training qualifications but many had gained degrees, diplomas or certificates in various aspects of management. Sometimes these included a module on training skills. Workers trainers were found not to have any formal qualifications for training and often no mention of training responsibilities was made in their job description. In practice, many had a heavy training load whenever trainees were allocated to their department. Their responsibilities included:

- explaining and demonstrating work skills and
- informally judging the effectiveness of learning and competency.

Worker trainers normally had background in the industry and saw their future career in the company or industry. Some expected to progress to supervisory of junior management post. Teachers and trainers for initial and continuing vocational training in the UK could be classified into[23].

- teachers in schools, including technical schools;
- teachers and lecturers in colleges of further education;
- lecturers in universities;
- trainers in organizations

In the UK, vocational education has been influenced by the introduction of the National Vocational Qualification framework. The standards for vocational competence will be approved by National Council For Vocational Qualification (NCVQ) and the qualification at the five different levels will be based on these standards.

Teachers in school must be qualified to teach, either via a Bachelor of Education degree or a first degree in an academic subject, followed by a postgraduate certificate. Trainers employed in industry, in the public sector, or working as private providers of training are not required to have any specific training o teaching qualifications, this also applies to lecturers in colleges and universities. In fact, many have relevant academic or vocational qualifications, but there is no statutory requirement. Industrial experience is the norm. Furthermore, higher education is not the main route into vocational teaching and is less common among the more mature teachers in further education.

The Curriculum and its Components (U.K.)[24]

The framework of competence-based National Council for Vocational Qualification (NCVQ) for teachers currently proposed by the City and Guilds and The FEU/TDLB insists on a strictly behaviourist view of human learning and experience. Discrete elements of competence, derived from functional analysis procedures and which are arbitrarily combined into free-standing units, are claimed to provide a complete picture of competent performance at work. This behavioural profile of professional practice has been criticised. Adrian Chown (1994) argued that they concentrate on modelling the competent performance of routine tasks and task 'skills'. As a result, they tend to provide only static and partial models of teaching. While they are valuable in providing outcome-based criteria for assessment purposes, on their own a profile of this sort is an inadequate basis for professional and personal development. He proposed that a Post-graduate Certificate in an education program needs to be combined with core criteria and with a reflective practice process to model more adequately the real practice of proficient teachers. The curriculum model suggested by him has these three components:

- A set of outcomes organized into modules
- A set of common core professional criteria
- Reflective practice

It has been argued that a curriculum of this kind would seem to have much more in common with the competence-based qualifications currently advocated

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generally by the NCVQ and specifically for teachers by the Further Education Unit (FEU / TDLB) and City and Guilds Competence – based profile of outcomes. However, their current forms prove inadequate for the proper preparation of professional teachers. The writer's involvement in preparation, implementation and evaluation of this kinds of curriculum showed that it can only meet a limited conception of the teacher's role. He shared with others their doubts over the conceptual basis of Programs based on defined competencies and objectives. It was said to be reductionist in effect, breaking teaching into a series of discrete acts when, in reality, the whole of the teaching act is more than the sum of its parts. Its design criteria provides partial, atomistic and mechanistic descriptions of what proficient teaching entails. It focuses on routine tasks and on superficial task skills in an area of activity where context, interaction, contingency and change are crucial aspects of practice. Each routine task is analyzed "to within an inch of its life" while what is difficult to describe – knowledge, understanding, interpersonal skills, relationships, reflective practice, for example the "soft competencies" – are ignored or glossed over.

The change proposed by the author is to find ways of identifying, describing and incorporating the 'higher level activities through which people can manage complexity and change in order to cope effectively with change. Hence, teachers need to develop a professional practice which combines knowledge and understanding, intellectual and problem-solving skills, and pragmatism in complex situations, with a high level of interpersonal and communication skills. In short, they need to learn to think and act as proficiently and professionally as a teacher does.

Nonetheless, competence-based qualifications offer a very limited description of what proficient teachers do. They fail to reflect the full range of roles, skills, abilities, knowledge, understanding, principles and practices which the post-secondary sector entails.

An alternative qualification model is offered by Chown (1994) which combines core professional criteria and reflective practice in an attempt to move beyond the limitations of competence-based qualifications.

Initial Vocational Education Teachers and Trainers in Spain

The LOGSE[25], is the basis for the regulations of teaching and training personnel. In the LOGSE, the basic provision is contained in section 24. Royal Decree 1701-91 sets up a Secondary Teachers Body, to which teachers in

general areas were to belong and general conditions for admission to the Body of the Teachers of Secondary Education were drawn. Also, the FP Technical Teachers' Corps was initiated. Teaching resource centers have been established to allow teachers to receive continuing training in methodology and technology.

Initial Vocational Training for Teachers at the University Level[26]

Teachers must complete a specialist teacher training course before admission to a teaching career. At the present time, the only specialized courses recognized by the Ministry of Education are the Courses in Teaching Proficiency. These courses are offered by Institutes of Educational Science. The students of these Institutes receive a program in accordance with the subject range available. The duration of these courses are between 250-300 hours, of which half is practical teacher training. The courses offered by these Institutes covers three broad areas:

1. *Psychology:* a specific syllabus block in psychology is offered concerned with the psychology of learning and the psychology of adolescence.
2. *Didactic:* specific content is offered which includes teaching methodologies. These include how to plan, how to prepare a teaching unit on the basis of objectives and content, specific problems of teaching in the area concerned, and learning strategies.
3. *Teaching practice:* It is the main area in this program. The aim is for the future teacher to have experienced all levels of an educational center, to have prepared a teaching unit and to have taught a class.

TRAINING PROGRAMS FOR TEACHERS AND TRAINERS AT THE LEVEL OF OTHER BODIES

1. The Ministry of Education

The Ministry of Education is involved in updating the training programs for teachers in order to offer a further training program for teachers and complement other training courses carried out by the teacher centers or by public or private bodies. The aim of the training programs offered to the technical teachers in further education is to continue and update their knowledge, especially in technological subjects and to reinforce those teachers' links with the world of work and to familiarize them with new technologies. A long-term training courses is designed to be essentially technical and taught in 200 hours. The duration of the course is designed to

be implemented in three two-weeks stages, during the term time. The plan of these courses is drawn up anew every year with reference to two criteria: the results of the survey carried out by the Ministry of Education on the training needs of teaching staff, and the labor market. An extract from this program is shown in table number 1. The program for 1994-95 considers 56 courses for 13 vocational classes[27].

2. In-Service Training for Teachers

Teacher training system targeting permanent teachers and temporary contracts and trainers at associated centers. A policy of modular, individualized, continuing training program is designed to address the development of teaching and technical skills. The training policy course consists of technical training and methodology training. The duration of technical training varies from 30 to 100 hours (60 hours is the average). Two types of technical training courses are offered: updating training and further training. Methodology training consists of initial and further training, of variable duration. There is other training in the form of continuing training lasting for less than 100 hours in all cases. Names of courses and duration of hours are shown on table number2[28].

3. Training by Regional and Local Authorities

Programs in the various Autonomous Regions and local districts do vary from place to place. Candidates on these programs are generally required to possess either an academic or vocational qualification suited to the subject matter or the evidence of work experience which includes vocational – technical knowledge. The case of Catalan Government's Labour Advisory Board presents an example of a teacher training program adapted in this region. The program includes four types of trainer training course which are directed at various levels of occupational training.

The courses are listed as follows[29].

1. A 10 module course of 25 hours which aims at all kinds of trainers. This is compulsory for all trainers working on courses subsidized by the Catalan Government, particularly those who have not undertaken a course in training methodology. They need to register for one module only.
2. An occupational training course for trainers on the permanent staff of cooperating bodies. The duration of the course lasts for 125 hours.
3. A Master's course in trainer training is run in cooperation with the *Universidad Politecica de Barcelona*. It aims at professional trainers who

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have to design and manage training plans. The duration of the course lasts for 1100 hours.

4. A distance course for trainer training is also offered on the basis of video-technique with written back-up materials.

Section 17.3 of the Royal Decree 850/93 establishes the following prior training requirements for technical teachers of vocational training as follows[30].

1. Possession of a university diploma, a technical engineer's certificate, a technical architect's certificate, or other qualification of equivalent level for teaching purposes.
2. Possession of either a specialized qualification or a teaching proficiency certificate.
3. Candidates are selected by means of a competitive examination plus a period of teaching practice. Those who successfully complete these stages are admitted to the relevant teaching body, the Body of FP Technical Teachers.

Initial Vocational Education Teachers in Saudi Arabia and Bahrain

In Saudi, in 1992, the Institute of Preparing and Qualifying Trainers and Teachers for Technical and Vocational Education was established. It used to qualify teachers for technical and vocational schools and vocational training centers.

By the year 1993, Rayyad College of Technical Education initiated a Bachelor of Education for those intending to teach in technical and vocational schools. At the same time, training of trainers for different technical centers is carried out at the Institute of Preparing and Qualifying Teachers which is under the supervision of the Supreme Committee for labour and vocational training[31]. The duration of the program is two years. The enrollment on this program is only open for students who have graduated from post secondary technical colleges. The program at this college covers the following areas[32] (see Table Nos. 3 & 4).

In Bahrain, to overcome the problem related to the urgent need for national teachers for technical and industrial schools, the college of Engineering at Bahrain University took the initiative in cooperation with the Ministry of Education, and designed a Bachelor program entitled "Engineering/ Education" for selected graduates from Industrial Secondary Schools. This program was implemented in 1989/1990. It lasts for six years[33].

The program is organized in the following way[34].

1. Introductory courses for one year.
2. Diploma in Engineering for two years.
3. Three years for Bachelor requirements. These include the following courses (see Table No. 5):

Students are required to select 15 credit hours (five courses) from the subjects listed in Table No. 5, according to their interest of specialization. In terms of in-service training for teachers working in the industrial schools, it is suggested[35]:

1. Offering material and non-material incentives for qualified and intelligent students and teachers to either join the teaching profession, or remain within the educational system.
2. Designing short term in service training courses to expose teachers to new experiences, information and skills in their profession.
3. Scheduling specific hours in their timetables to be used for discussing and studying certain technical and educational problems and issues related to the field. This arrangement will encourage creative thinking among them.
4. Adapting a general policy for in-service training which will allow teachers to spend one semester in large companies, in or outside the country, related to their field of teaching every four years. This procedure will allow them to be exposed to the latest development in their area and to exchange experience and ideas regarding the industrial schools' output and the companies' 'expectations in terms of students' performance and competencies.

Conclusion

The technological advances, the globalization of markets and rise of high performance companies are altering the world of work dramatically and changing the aims, roles and responsibilities of vocational/technical institutions and bodies as well as students and teachers as they prepare for the 21st century. The quality of vocational training institutions stands and falls by their ability to qualify students teachers. To conclude the present paper, we have demonstrated how developed and developing countries tackle the problem of the shortage of qualified vocational/technical teachers. A range of expedients has been adopted within the countries under investigation. A quite remarkable variety of institutional structures is being employed, including Teachers' Colleges where vocational/technical teachers are trained alongside other kinds of teachers. Specialized institutions are exclusively preparing and training vocational/technical teachers (UK, Germany), and in-service

organizations for training teachers. Features could be forwarded from the models of initial training teachers in Germany, UK, Spain, Saudi Arabia and Bahrain. These features are:

- Teachers in all countries studied are not employed in the field of vocational education without initial vocational training.
- A university degree qualification is the minimum requirement for vocational/technical teachers, plus some experience in the specialized field of study, or a degree in vocational education without work experience.
- Experience in the field of specialization is essential for any teacher who is willing to join the initial vocational technical training teacher program.
- A Diploma is a must for any teacher who wishes to join vocational/ technical education if he/she does not have a previous initial educational background.
- An initial vocational training program should include educational and theoretical as well as practical subjects.

The program in Germany, for example, concentrates more on the practical side at various factories and companies, related to the specializations of the student teachers.

In the UK, the situation is different. Attention is given to the educational and professional aspects and teaching practice at school level. To be accepted as a vocational/technical teacher, individual must have two years of professional practice in a related field.

- In Germany, educational supervisors must accompany newly employed teachers in vocational/technical schools for a period of time (maximum two years) in order to help them to integrate and be familiar with the atmosphere of the schools. Regular supervision and guidance would help them to be competent in their teaching and solve the problems they face.
- Coordination and integration between vocational/technical training colleges and industrial organization is highly considered in the countries studied. These arrangements initiate the transfer of new technology applied in the actual field. It also allows more opportunities for prospective teachers to benefit from and transfer the new technology and development to their student teacher in future.

Some suggestions could be drawn from the analysis of the systems related

to qualifying and training vocational/technical teachers and would be suitable for any educational policy in Oman. These are:

- Introducing initial and in-service training programs to qualify nationals who will contribute to the needs of national manpower demanded in most vocational/technical institutions and fulfill the policy of Omanization. As mentioned earlier, the majority who work in technical/vocational and institutions are non-nationals who come from different backgrounds and have various professional experience.
- Vocational/technical training should be directed at both males and females in order to achieve the national targets related to developing manpower.
- Developing special initial vocational training programs for individuals who hold university degrees from vocational colleges, such as engineering, agriculture, commerce, etc.
- Designing a diploma program whose content concentrates on the educational and practical aspects of training.
- The College of Education and Islamic Studies (CEIS) at Sultan Qaboos University should take the initiative in designing and introducing such programs, because it has the most developed facilities and equipment, within the college itself and other colleges concerned with different specializations. In addition, the college is within reach of industrial complexes e.g. Al Rusayl, where many companies and factories are located. Also, many businesses and services within the Muscat region could facilitate the opportunities for initial training.
- More opportunities should be given to industrial college graduates to pursue their university studies, particularly in areas which are not open yet, such as business. The criteria for selection should not be limited to their grades but should mainly concentrate on their practical experience in the field.
- Setting up criteria for vocational/technical teachers' recruitment.
- Developing rules and regulations regarding the personnel who will be employed as vocational/technical teachers.
- Establishing a committee for vocational teachers' recruitment in order to select the most suitable candidates for profession. This committee should be represented by: members from the Ministry of Education, members from the practical colleges and College of Education, vocational/technical teachers at industrial colleges and vocational centers and members from the private and public sectors/industry. Building bridges and links between institutions concerned with teacher education and industrial organizations, as well as other post-secondary, vocational/technical institutions in Oman which offer programs and training below university degree level.

Table No. 1: Examples of Training Available for FP Teachers in the Academic Year 1994-95

Vocational Classes	Name of Course (duration in hours)
Administration & Management	Public Administration (185 hrs.) UNIX Environment, Languages C, C++ and SQL (148 hrs) Financial Marketing (148 hrs)
Graphic Arts	Update Graphic Arts (200 hrs)
Motor Vehicles	Repair Shop Management (250 hrs) Ignition Systems and Electronic and Diesel Injection (205 hrs)
Consumers and Marketing	Consumers (185 hrs)
Construction	Specialization in Structural Calculation (150 hrs)
Electrics and Electronics	Operating Systems & Language C in Electronics (200 hrs) Microprocessors/microcontrollers, PC Architecture (198 hrs)
Catering and Tourism	Bakery Techniques (177 hrs) Marketing and Quality in Service Companies (200 hrs)
Personal Image	Hydrothermal Techniques and Massage Aesthetic Applications (130 hrs)
Timber and Furniture	Update in Timber and Furniture Technology (210 hrs)
Industrial Mechanics	Supplementary Electric Course for Mechanics (105 hrs) Advanced Course in Automation and Handling (105 hrs)
Chemicals	Total Quality in the Chemical Industry (270 hrs)
Public Health	Nutrition and Analysis of Foodstuffs (200 hrs) Bucco-dental Promotion Techniques and Care (175 hrs)
Textiles	CAD-CAM in leather tailoring, production, machinery and technology (200 hrs)

Table No. 2: In-Service Training Courses

Sector	Name of Course (Duration in hours)
Agriculture	Vineyard restructuring (50 hrs)
	Soil-less crops (50 hrs)
	Introduction to pneumatics in agricultural applications (30 hrs)
Construction	Thermal and sound insulation in buildings (25 hrs)
Industry	Motor vehicle electrics and electronics (90 hrs)
	Quality management (50 hrs)
	Digital and analogue treatment with PLC structured robot-programming level 11 (60 hrs)
	135-U mono and multi-processor robots (75 hrs)
	Telecommunications (60 hrs)
	Setting up an Ethernet local network for Novell NETWARE 3.11 OS (85 hrs)
	Development of micro-processors 111 (100 hrs)
	Personal computer maintenance (50 hrs)
	Meat industry, preparation of packed meats (30 hrs)
	CNC parameter programming technician (60 hrs)
	Diecasting (75 hrs)
	Textile quality planning and control (50 hrs)
	CAD applied to design and make-up of industrial patterns (50 hrs)
Services	Management IT: current accounting version (50 hrs)
	Page maker, desktop publishing (50 hrs)
	Animation: 3D Studio Animator Pro (50 hrs)
	Educational technology (50 hrs)
	AUTOCAD 12 update and advanced techniques (50 hrs)
	Graphic design: Windows environment (25 hrs)
	Computerized reception management (100 hrs)
	Manual and computerized cash and carry and wine store management (50 hrs)
	CAD work station operation (WORKSTATION) (84 hrs)
	Expert on European Communities (45 hrs)
	Access to national and international transport (50 hrs)

Table No. 3: Areas of Studies

No	Area	Unit	Percent
1	Specialized courses (Theoretical & Practical)	36	48
2	Educational Courses	25	33
3	General Courses	14	19
	Total	75	100

Table No. 4: The Educational Courses to be Studied

No	Course	Credit
1	Foundation of Education	3
2	Educational Psychology	3
3	General Teaching Methods	2
4	Specialized Teaching Methods	3
5	Educational Technology	2
6	Educational Evaluation	2
7	Curricula	2
8	Technical Education & Vocational Training	2
9	Field Training	6
	Total	25

Table No. 5: The Program Courses for Bachelor's Degree

No	Course	Credit Hours
1	**Educational Courses:**	
	1.1 Foundations of Education	3
	1.2 Educational Technology	3
	1.3 Psychology	6
	1.4 Teaching Methods	6
	1.5 Evaluation	3
	1.6 Curriculum Development	3
	1.7 Teaching Practice	6
	1.8 Health & Industrial Safety	2
	1.9 Physical Fitness	2
	Total	34
2.	**General Courses:**	
	2.1 English Language	9
	2.2 Mathematics	12
	2.3 Physics	6
	2.4 Industrial Drawing	3
	2.5 Chemistry	4
	2.6 Computers	3
	Total	37
3.	**Specialized Courses (selective)**	
	3.1 Power Production	3
	3.2 Electronic Materials (1)	3
	3.3 Electronic Materials (2)	3
	3.4 Energy System	3
	3.5 Control & Movement	3
	3.6 Electronics (3)	3
	3.7 Protection System	3
	3.8 Electrical Circuits Design	3
	3.9 Sensitive Equipment Control	3
	3.10 Electricity Circuits	6
	3.11 Digital Electronics	3
	3.12 Electronics	4
	3.13 Electricity Connections	2
	3.14 Electrical Power System	6
	3.15 Machines	8
	3.16 Electronic Energy	3
	3.17 Communication System	3
	3.18 Electrical Technology	4
	3.19 Magnetics	3
	3.20 Theories of Electrical Circuits	3
	3.21 Control Circuits	3
	3.22 Graduation Project	3
	3.23 Industrial Training	3
	3.24 Computer	3
	Total	81

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Topic No. 3

Attitudes of Student – Teachers Toward the use of the Internet in Teaching – Learning Process in the Colleges of Education for Teachers in the Sultanate of Oman.

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Background

From an ancient times till now, the education and teaching – learning process works together to produce a well adapted man to his environment, who is capable of adjusting himself to every new development that may take place in his society.

Now, as we are standing at the edge of the 21st century, the century of Information, Technology and Media, we start to feel we are strangers in our world, the world of the future generations, this feeling makes it necessary to try and fill the gap between us and on future generations by taking into consideration their needs for a better society (Allen Tough, 1994).

This demands a better understanding of how to direct future generations to the right use of some of the modern technologies, since the 21st century will be the Information Technology Age.

Information Technology is defined by Bob Sparks[1] as: "The application of electronics to the collection, storage, transmission, retrieval and processing of information in all it's forms, together with the social and economic effects of these applications". One of those technologies is the "Internet".

The Internet is defined by Martin G. Levin[1] as: "The global network of connected computer networks", while Joseph A. Brawn defined it as: "a vastly intricate global network of servers that can be accessed by clients through use of a micro-computers".

The Internet has different facet, one of which is the Web, Martin G. Levin described the Web as "that part of the Internet which offers users a giant collection of electronic documents called home pages that they can browse". The use of the Web is easy, it is full of pictures, sounds, photographs and even movies[2].

The homepage is the first "page" on the web one can see when one accesses to the Web. Internet clients are needed, called the software, which performs an Internet function such as gopher and FTP; other types of clients are browsers such as Netscape, or Mosaic which are used with the World Wide Web.

A Brief History of the Internet:

The history of the Internet was accidental. It started as an idea in 1964,

[1] Bob Sparks, School Science Review, p25, 1989
[2] Joseph A. Brawn, Social Education, 1997

while developing top-secret thermonuclear war scenarios for the department of Defenses Advanced Research Projects Agency (ARPA). Communication possibilities were also developed.

In 1969, the work with ARPANET was completed, it was the first computer mediated system to function for launching a counterattack in the event of a nuclear first strike by another power. ARPANET, a simple network, contained only 23 computers.

In 1973, a shift occurred from the simple ARPANET to the complex Defence Department one. It now has approximately 20-30 million computers worldwide which enables information to be consumed and published via the Internet.

Finally in 1993, a new development was added to the Internet, that was pictured information for the users.

The Internet and The Educational System:

Educators started to think of the Internet as a mean for education. An educational system consists of three major elements: the teacher, the learner, and the curriculum. The chance to use the Internet in any of these elements or their subelements seems to be high.

The Internet may be applied to the educational system for different purposes, for example:

1 – Curriculum Resource

The teacher may use the Internet as a source for the curriculum to get information and ideas about a certain academic subject. In order to do this the teacher must be familiar with different Internet clients and search engines (for example: Lycos, Yahool and Alta. Vista). The teacher selects the information and resources which brings the most meaningful learning for students.

2 – Expression of students Interests

Students can swop information with each other through electronic mail (e-mail). A Student can send a message about the subject of Interest and ask the respondents to reply.

3 – Electronic Discussions

Students can be directed by their teacher to use the News groups which are a common way to conduct an electronic discussions (e-discussions) through the Internet. Newsgroups are different from e-mail in that it is more flexible since it does not necessitate the subscription of the individual in order to get the reply:

on the contrary the student may use the Newsgroup of interest to him and read messages following a particular topic of discussion. The benefit of this is being in touch with experts in the required subject talking about their own experiences from all over the world.

4 – Accessibility

A possible way for the accesssment of students learning is to ask students to publish their own homepage on the web as an illustration of their understanding (Joseph Braun, 1997).

5 – Moral education

New models for moral education should be incorporated in our schools today to prepare students for the future.

The Internet may apply new values and civic education which is more suitable and up-to-date, but care should be taken to choose the good and valuable ones.

6 – Critical Thinking

Critical thinking is an essential skill for those who use the information superhighway: the Internet. This skill is essential to distinguish between good, and damaging information. So the Internet may help in developing this essential skill among students who depend upon themselves to choose the required information.

7 – Multicultural Education

Intercultural Internet can create a certain types of education where no geographical or political barriers are found. Students from Oman can receive the same information as students from Jordan, U.S.A. or any other country at the same time.

Multicultural education should include the teaching of common values such as democracy, justice, tolerance and individual rights. Multicultural education also includes introducing students to the various methods of communicating their ideas and public concern's. This may enhance the awareness of diversity among the students and is essential to prepare them to be global citizens or more specifically global netizens (Edna Aphek, 1996).

8 – Class room Field Trips

The Internet offers the opportunity to visit places of interest electronically without leaving the classroom. Fieldtrips are important activities for different subjects especially the sciences. Students may engage in an interactive

experience of exploring sites, providing them with a variety of skills such as collaboration and the development of their own electronic fieldtrips.

9 – Record storage

The Internet can be used to store student records such as their names, date of birth, addresses, syllabuses, grades, test results as achievement and intelligence and a lot more.

10 – Researches

A site may be accessed for researchers to communicate through the Internet. The purpose of presenting such a site is to promote collaborative research and activities related to the development of any part of the educational system.

11 – Libraries

There is some evidence that the Internet can be used in schools and/or universities libraries for the purpose of enhancing the teaching learning process and to support the curricula. This may be generalized to a large number of educational and cultural libraries open to members of the public.

12 – Acquiring Skills

Students can practice and thus acquire certain skills as driving, swimming and others through the Internet. In general, students can use the Internet to practices the decision making skills as in business and banking administration.

Internet characteristics:

The Internet has many characteristics:

1. A Plethora of information sources, scope and variety.
2. Speed and easy of access to the information (Clark Johnson and Jack Rector 1997)
3. Recent and up to date information
4. Comprehensiveness of information from different regions

The Internet provides the opportunity for cooperative work and critical discussions among people from different parts of the world. This is potentially creating global cohesion.

Problems and difficulties of the Internet:

Inspite of the characteristics and benefits the Internet has, problems and difficulties arises from its use, some of which are:

1. Unintended Outcomes:

There is a fear from the consequences of the undirected use of the Internet such as the fear of people hearing pornography, crimes, lack of security, and the activities of hackers.

2. The Cost:

To access the net an institution needs a lot of money; for the purchase of computers, software, training people especially teachers and students to use it, for programrs and for maintenance. Experienced people are needed to prepare programs, thus time and money are necessary to prepare these persons to supply educational institutes with the required programrs.

3. Administration:

Some difficulties may arise at the level of administration of the school and/or the university concerning the class schedule: when will the students go to his classical classes? and when will they go to the Internet classes?

The coordination in the student schedule may create some problems and/or difficulties.

4. Efforts:

Large efforts are needed to prepare different programs for different subjects.

The Importance of the Study:

The need for this study has evolved from a number of recommendations in using the Internet from a variety of people and institutions. These include:

1. H.R.H. Prince El-Hassan bin Talal in his opening speech in ICET, 43rd Assembly in Jordan (1996). H.R.H. stressed the need for the educational system to adopt the use of modern methodologies and training courses to promote information technology. H.R.H. also stressed the importance of preparing the citizens of tomorrow by sharing universal values and ethics to contribute to a global society.
2. The call of the Omani General Manager of the Colleges of Education for teachers to the use of modern methods of teaching in order to raise students standards in achievement, skills and attitudes.
3. The Jordanian Ministry of Education Ten Year Cooperative Plan of 1990, gave attention to the utilization of educational technologies.

4. The International Commission on Education or the 21st century contains the statements: "The greater use of new Technologies in adult education and specially in-service training of teachers" "The strengthening of developing countries infrastructures and capabilities in this field and the dissemination of such technologies throughout society", and "The launching programrs for the dissemination of the new technologies under the auspices of UNESCO".

5. Mustafa Mohammed Mituali recommends in his article "Arabic Satellite" to stop the use of the traditional teaching methods and to start using new ones, which may help in solving educational problems such as the increased number of students in classes, the shortage of teaching staff, the inability to solve daily and social problems and the increase demand on teaching at the university level.

6. The Arabic Seminar for Construction and Development of Curricula in Vocational Teaching held in Sudan (Al Khartoum), 1996 recommends the "Diversification of teaching – learning activities and the introduction of the new methods and technologies for teaching and the necessity to exchange experiences and research among Arab countries".

From all the above mentioned ideas, thoughts and recommendations, the researchers were stimulated to conduct this research, also the researchers noticed that the students are eager to use any new technology or at least to know something about it.

For these reasons, the researchers decided to focus their study on the title: "The Attitudes of Student – teachers towards the use of the Internet in Teaching – Learning Process in the Colleges of Education for Teachers in the Sultanate of Oman".

The researchers hope that this study will help in the following areas:

1. The Development of the elements of curricula, especially methods of teaching and the Media.

2. To Increase the amount of research conducted in the area of information technology: Internet in Education.

3. To guide other researches in different aspects of the Internet.

The Problem of the Study:

The problem of this study can be summarized in the following two questions:

1. What is the general attitude of student-teachers towards the use of the

Internet in the Omani Governmental Colleges of Education for teachers?

2. Is there a significant difference (α - .05) among the attitudes of student-teachers towards the use of the Internet in the Omani Governmental Colleges of Education for teachers due to the difference in their specialization? (Science and Art)

Operational Definition

It is useful to define some concepts in an operational way as follows: Attitude: the responses of acceptance or refusal towards a certain subject. Student-teacher: the student enrolled in the colleges of education for training to be a teacher.

Internet: A new type of information technology that enables persons (people) to communicate and exchange ideas, thoughts and experiences all over the world via the computer.

Teaching-Learning Process: the process by which a teacher transfers information, skills and attitudes to students whereby their professional conduct is affected.

Colleges of Education for Teachers: University colleges that prepare student-teachers to be teachers. It is of 4 years duration, at the end of which students can take the Bachelor degree.

Limitations of the Study:

1. The sample of the study consists only of Omani students.
2. The sample is limited only to Sur College of Education for Teachers.
3. The correctness of the results of the study is affected by the validity and stability of the measurement tool.

Assumptions of the Study:

1. 2nd year students are equivalent to 3rd year students in their experiences and knowledge.
2. All students are equivalent from their economic and social points of view.

Previous Studies:

There is little research about the Internet. However some include the following. A study conducted by Frederick George Jaeschle (1996) with the title of "Creating Music Using Electronic Music Technology: Curriculum

Materials and Strategies for Educators", The purpose was to create and integrate electronic music technology into the classroom as a music curriculum and to test its effectiveness.

The results of the study assures the importance of the following elements as components of the suggested e-music curricula: the listening examples, extensive review of related material and the references.

Another study was done by Gay Lyn Meter (1996) with the title "The Effect of Teacher Training on Internet Usage in the Classroom", The purpose here was to study the effect of instruction on students level of anxiety when using an electronic information system. The results of the study showed that directed instruction toward the use of computers and Internet decreased the level of anxiety when using these systems.

In another study entitled "Technology Now! One School District's Journey into the Information Age" performed by John Thomas Umekubo (1996), with the purpose of introducing the monitory, improverished student population into the information age, showed that this document – Technology Now! – served as a tool to show how to implement a technology program in any school or district.

While Daonian Lius (1996) research was about "Teaching Chemistry on the Internet: A Qualitative Case Study", The purpose was to examine the experiences of students and teachers gained from a graduate general chemistry course delivered through the Internet. The findings showed a positive evaluation of this Internet course and there was a recommendation for future research in distance education.

Daniel Kevin Anderson (1995) did his research on a mixed sample of 24 in-service teachers from the state of West Virginia. The title of his research was "The Effects of An Internet Workshop, Prior Computing Experience, and Learning Style on Inservice Teachers, Internet-Related attitudes and Inter-Related Knowledge".

1. If 2 weeks is enough time to teach Internet skills.
2. Whether participants of the previous mentioned workshop underwent changes in their attitudes and/or skills toward Internet.
3. Whether previous experience of computer or learning styles affect the attitudes and skills toward the use of the Internet.

Another study was conducted by Marelene Ann Kohn Goss (1995) called

K-12 Internet Training and Dissemination of Educational Resources for Instructional Change and Systemic Reform (Kindergarten, Twelfth-Grade).

Two questions were posed in this study. The first was "Can educators learn to use the Internet?", and if so "Will they teach others at their sites?" The results of the study suggested new models for educational change.

While a study entitled "Design and Implementation of a Distance Education Course Over the Internet" performed by Richard James Smith (1995) with the intent of designing a course about distance education to teach information technology: the Internet, concluded what should be considered in the design and implementation of a distance education course involving a large number of multicultural participants with wide geographical backgrounds.

Another study was applied to school superintendents in Alabama public schools by Carol Anne Barter Doucet (1994). The title of the study was "Telecommunications in the Alabama School System (Distance Education), the purpose of which was to determine the extent and use of telecommunications within the public schools of Alabama.

The results of the study pointed to the fact that in spite of all the difficulties educational technology has faced, still new telecommunications are used and new telecommunication programrs are expanding although teachers and staff are undertrained in technology. Seung Hyun Jin (1994) conducted a study entitled "The Design of Instructional Material for Teacher Education: A Tutorial Program for Computer – Mediated Communication" with the intent to develop a guide program for student-teachers to access USENET.

And finally, a research was conducted by James Alan Russet (1994) upon students taking their secondary science methods curriculum block at the University of Nebrasca – Lincoln. The title of his research was "Telecommunications and Pre-Service Teachers: The Effects of Using Electronic Mail and Directed Exploration of Internet on Attitudes", the study was designed to evaluate the effects of using an e-mail and Internet access on undergraduate education students attitudes towards telecommunication in particular and educational technologies in general. The results indicated that there should be an integration of the Internet with the method/curriculum courses. It also indicated that e-mail should not be considered as the only mean for communication, nor as a substitute for personal discussions.

From the above researches conducted in the field of Internet, it seems obvious that there are an encouraging developments as to the use of the

Internet in curricula and instruction (Russett, 1994; Goss, 1995; Smith 1995, Liu, 1995 and Jaeschke, 1996).

Other researches pointed to the importance of the level and programs of student-teachers in becoming familiar and skilled in the use of the Internet in educational purposes (Jin, 1994; Russett, 1994; Anderson, 1995; Meyer, 1996). At the same time, Meyer (1996) in his previous research indicated the importance of the use of the Internet in reducing the anxiety among students through their instruction process.

Method & procedures

Society & Sample of the Study:

The society of the study was all student-teachers enrolled in the Governmental Colleges of Education for Teachers in the first semester of the academic year 1997-1998

The Sample was (80) of Student teachers of Sur College of Education for Teachers. Sur college was chosen because of the ease of study application and data collection and because the researchers work at this college.

The sample consisted of (38) of the second year science student-teachers & (42) of third year arabic language student teachers.

Measurement Tool

The measurement tool was a questionnaire prepared by the researchers to measure the attitudes of student-teachers towards the use of the Internet. It consisted of (26) statements of the Likert scale type consisted of five categories: strongly agree, agree, undecided, disagree, strongly disagree & it was required from the respondent to mark the suitable one.

Concerning the validity of the tool, a committee of specialized persons of educational psychology, Arabic language & measurement & evaluation checked its suitability. As a result, some statements (2 out of 72) were cancelled & others were corrected from a language point of view. Regarding each statement, its discrimination, difficulty and simplicity coefficients were calculated, and it was found (26) out of (69) statements were suitable and were considered to be the final questionnaire. The remaining (43) were discarded (Fig. 1).

Statistical Treatment

The statistical treatment of the data was the use of each of percentages & T-test.

Results of the Study, Explanations & Recommendations

To know the general attitude of student-teachers towards the use of the Internet in the colleges of education for teachers, the percentages of their approval or refusal of each statement were calculated & considered as an indication of their attitudes. The percentage above 50% is considered as positive (+) attitude & less than 50% as negative (–) one (Fig 2).

It can be noticed that statements number 4, 10, 12, 13, 15 & 20 are less than (1/2) of the overall (26) statements & it showed a positive attitudes toward the use of the Internet, while the remaining (20) statements didn't show a positive attitude.

Therefore, the general attitude of the student-teachers towards the use of the Internet is negative.

This can be explained by the fact that every new tool or machine or idea faces on objection from most of the people, which may be because of their fear of the effect of this new thing, that its introduction may contradict their ideas, beliefs, customers & even their tradition, & may be because of the little knowledge they have about it.

It may be because they are untrained in the use of computers, or because they are accustomed to the traditional ways of learning & teaching & don't want to practice a new ones.

Concerning the second question of the study, the results showed no significant differences between each of the science & Arabic groups of student-teachers (table 1); that's to say no differences among their attitudes towards the use of the Internet or teaching-learning process, which is a negative attitude.

This may be due to the strong attachment of student-teachers to the traditional methods of teaching and learning regardless of their specialization, or this may be due to the effect of the teacher- the human being – which is stronger than the effect of the machines in all cases especially when students admire, like & trust their teacher & thus prefer their human touch.

Also the shortage of continuous information and knowledge about the Internet which is necessary to remind the students that there is something new which may be useful for education and which may help in changing their

attitudes over time is another reason for the result of the 2nd question of the study. This means also that the students have no idea about the Internet and one lecture is not enough for them to change their attitude.

This means also that the introduction of information and knowledge about the Internet to the students is the responsibility of their teachers in the 1st place and the media in the 2nd place since it is not related to the nature of their specialization.

Recommendations

1. Repetition of the study on different student levels.
2. Continuous knowledge supply to students about information technology and it's development in the from of seminars, workshops & class lectures.
3. Focus on information technology through media & press.
4. Conduct in-service training courses for teachers about the use of computers and the Internet.
5. Start to teach students how to use computers & other new developed tools or machines from the elementary level.
7. Encourage students at any level & with any specialization to the use of information technology.

Fig 1. Questionnaire Statements, its Discrimination, Difficulty & Simplicity Coefficients

No.	Statements	Disc coef.	Diff. Coef.	Simp Coef.
1.	I feel worried whenever the Internet is mentioned	0.31	0.52	0.48
2.	I am usually interested in the Internet.	0.23	.7	.3
3.	I wish I could work through the Internet.	.38	.59	.41
4.	The Internet provides me with further information.	.23	.41	.59
5.	The Internet helps to know the latest science findings	.31	.41	.59
6.	I don't appreciate reading books related to Internet	.31	.66	.33
7.	I would prefer a job combined with the Internet	.23	.7	.3
8.	The work through the Internet encourages me towards critical thinking	.46	.59	.41
9.	I don't see any justification in applying Internet into education	.38	.66	.33
10.	I imaging it would be interesting to recognize world leading figures through the Internet	.15	.52	.48
11.	I feel satisfied when I reveal conceptions through Internet	.38	.7	.3
12.	I would love to work through the Internet	.38	.44	.56
13.	I regard working through the Internet is just a waste of time	.31	.66	.33
14.	I wish I could obtain a private Internet connection	.31	.48	.52
15.	I feel pleased & enjoyed when I work through the Internet	.31	.7	.3
16.	I wish that the Internet could be introduced into the schools syllabuses	.46	.56	.44
17.	I believe that learners who work through the Internet would be more prepared for life in the 21st Century	.38	.7	.3
18.	I believe that working through the Internet avails me with the feeling of being linked to the technological development	.38	.48	.52
19.	I believe that the Internet is one of the methods of instructions	.23	.78	.22
20.	I think that the information obtained through the Internet is less advanced than the other sources	.38	.59	.41
21.	I suppose that the workings through the Internet enables learners to collect various views about the same topic	.46	.66	.33
22.	I would prefer working through the Internet to obtain information rather than seeking the same from the teacher	.15	.7	.3
23.	I feel satisfied when extend help to the others through the Internet	.31	.56	.44
24.	I wish I could acquire some academic skills through the Internet rather than learning them from the teacher	.31	.66	.33
25.	I suppose that working through the Internet would help me develop the skill of criticat thinking	.24	.66	.33
26.	I think the application of the Internet as a means of instruction would emphasize the comprehensibility of scientific knowledge	.31	.7	.3

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Fig. 2 Percentages of General Attitudes of Student Teachers Toward the Use of the Internet in Teaching Learning Process				
No. of Questionnaire Statements	**Science Specialization**	**Arabic Specialization**	**General Percentage**	**Attitude**
1	37	40	39	(–) ve
2	37	1	19	(–) ve
3	45	14	30	(–) ve
4	63	64	63.5	(+) ve
5	68	5	36.5	(–) ve
6	5	21	13	(–) ve
7	42	36	39	(–) ve
8	37	21	29	(–) ve
9	18	43	30.5	(–) ve
10	68	36	52	(+) ve
11	45	24	34.5	(–) ve
12	58	62	60	(+) ve
13	45	67	56	(+) ve
14	60	64	62	(+) ve
15	26	21	23.5	(–) ve
16	29	21	25	(–) ve
17	42	4	23	(–) ve
18	55	4	29.5	(–) ve
19	16	21	18.5	(–) ve
20	55	55	55	(+) ve
21	42	33	37.5	(–) ve
22	24	7	15.5	(–) ve
23.	32	31	31.5	(–) ve
24	39	21	30	(–) ve
25	29	26	27.5	(–) ve
26	42	4	23	(–) ve

Table 1. Results of T-test		
Calculated t	df	Critical t
.08	67	± 1.664
$\alpha = .05$		

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Assuring Total Quality Management in Education

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ABSTRACT

Educational systems consist of various interconnected inputs and complicated processes that require a systemic total quality management. Unfortunately, most educational systems pay more attention to the products of the system than to the processes essential to continuous improvement, and increased productivity. Assuring quality in education, however, is no more dependent on definite directions by the supervisors of all processes performed. To truly excell in the twenty first century, educators need to apply the concept of Total Quality Management in education; to tap the commitment to learn from people at all levels in the educational system; and empower both teachers and students to create, monitor, and control their own work processes.

In this paper, potential applications of Total Quality Management in education are described, research on several aspects of teachers' and students' empowerment are briefly reviewed and analyzed, and general principles of Total Quality Management are summarized.

ASSURING TOTAL QUALITY MANAGEMENT IN EDUCATION

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Introduction

Educational systems are complex systems characterized by continuous interactions among means and ends. They consist of various interconnected inputs and complicated processes that require both systemic and systematic quality management. The classroom life, for example, consists of mass processing systems in which many people take part, many interests and purposes are served, many events occur at a given moment (Bennett, Desforges, Cockburn, & Wilkinson, 1984). This makes it very difficult, if not impossible, for an outsider to assess and control the quality of teaching and learning processes that take place.

Educational literature has increasingly noticed the concern in business and industry for total quality control (Peter, 1987, Kaufman, 1988, & Waters, 1995). As a result, there are growing demands among educators and employers for quality education. These demands for "excellence" in education, however, require that systematic and formal proactive planning, continuous assessment and monitoring, and responsive revision take place throughout the entire system, because, the integrity of any product is usually dependent upon the integrity of the inputs and processes used in getting the product. Unfortunately, most educational systems pay more attention to the products of the system than to the processes essential to continuous improvement, and increased productivity (Bonstingle, 1992). All effort, in these product oriented systems, is thus expended on the speedy acquisition of the goal, or on increasing production, rather than on increasing quality.

As shown in business and industry, end-of-line evaluation is often costly and wasteful because the evaluator usually adds no value to the products. Deming (1992) points out that the evaluation of end results should not wait until the end of the educational process. Instead, evaluation should be designed and used to inform every point along the line in the educational production process, providing everyone involved with a solid foundation and opportunities for

optimal success. Therefore, to assure the quality of the end results, it is extremely important to plan the processes carefully, and continuously monitor and assess, these processes.

Total Quality Management has proven effective in various sectors such as business, industry, military, and government (Bonstingle, J. J., 1992). Apparently, there are many educational processes that can benefit from the concept of Total Quality Management such as the analysis, design, development, implementation, and evaluation processes. However, assuring total quality management in education is not an easy task. Because "quality" education can mean many things to many people, depending on who the customers are for the educational services (e.g. students, teachers, parents, employers, society, etc.). In addition, there are so many factors outside the control of the educational system that influence student learning.

Assuring total quality management, therefore, presupposes that educational systems be viewed as a sum total of inputs and processes working independently and working together to provide learners with the required skills, knowledge, abilities, and attitudes to function effectively and efficiently in a continuously changing world (Leithwood & Atken, 1995). Achieving this goal, however, requires that quality assurance should never be simply an exhortation to urge the students or teachers to greater efforts. Instead, it should be a system-wide attitude and commitment starting at the top. Assuring total quality management in education, therefore, requires monitoring the quality of all elements of the educational system: inputs, processes, products, outputs, and outcomes.

Purpose of the Study

The purposes of this study include: Highlighting of the need for Total Quality Management in Education; Summarizing general principles of Total Quality Management in Education; Suggesting potential application of Total Quality Management in Education; Reviewing and analyzing research on several aspects of teachers' and students' empowerment.

Methodology

A descriptive analytic approach was followed in this study. Description of general principles, and recommendations for potential applications of Total Quality Management in Education are based primarily on the review, and analysis of current literature on Total Quality Management in both business and higher education.

The problem and importance of the study

The educational literature has increasingly noticed the concern in business and industry for total quality control (Peter, 1987, Kaufman, 1988 & Waters, 1995). Research has provided compelling evidence that Total Quality Management in business and industry has proved the value of doing things right the first time (Buckland, et al, 1991). As a result, there is a growing demand among educators and employers for Total Quality Management in education. This demand stems from realizing the fact that efforts put into Total Quality Management will save time and money, and produce far better outcomes. Moreover, educational leaders are being pressed by various sectors as never before to be accountable for quality education.

The quality of students learning, however, in most educational systems is measured by students' abilities to move through schools and stockpile a number of grades, credits, and credentials. Lanier, (1989) argues that most educational systems do little to enhance students abilities to think and reason independently. The quality of students learning, thus, should be determined by students' skills and abilities to function effectively and efficiently in a continuously changing world.

Bonstingle, (1992) points out that efforts to assure quality in education are often expended on the speedy acquisition of the stated objectives, or on increasing production (e.g. number of courses completed; number of graduates, etc.) than on increasing quality. In addition, quality control in education is usually externally imposed, and is based primarily on standards, rules, and procedures used by administrators and supervisors. Moreover, the principals and supervisors usually represent formidable sources of authority to which teachers have to respond. However, research has shown that quality control imposed from outside is of little value (Buckland, et al, 1991). Quality control, thus, should rest in the hands of those who do the job, and accept the responsibility for the quality of their output.

This study attempts to provide educational leaders and other decision makers with research-based principles, and guidelines for quality management in education. The study also emphasizes the crucial need for empowering all individuals who are directly involved in the educational processes to monitor, assess, and improve their services and products.

Defining Total Quality Management in Education

For much of the last 30 years there has been serious inquiry in educational

literature into the meaning and measurement of quality, with little progress toward any agreement among the major stakeholders (Bonvillian & Dennis, 1995). Mingle (1989) argues that quality in the educational sector is merely a political term, where its meaning is inherently ambiguous and subject to hidden codes with interpretations dependent upon those using it at any given time. Apparently, the meaning of quality in education has an elusive character, and is often determined by how people perceive their personal needs and expectations have been met.

The movement of Total Quality Management in business and industry has resulted in an expanded body of literature attempting to define quality in education. From a business stand point, quality refers to freedom from defects and fitness for intended use (Juran, 1988). Quality Management in business stresses the importance of preventing mistakes before they happen, because production errors require reworking, or scrapping. According to Sims and Sims (1995), Total Quality Management is a data-driven process of continuous improvement using selected tools and techniques to plan actions and monitor the quality of all processes, products, and services that result in high levels of customers' satisfaction. Quality management, therefore, begins and ends with customers.

In this study, Total Quality Management in education refers to a systematic and systemic process of controlling, assessing, and assuring the quality of inputs, processes, products, and outputs of education. This definition centers on both how closely what happened resembled what was planned, and how well fit are the outputs of the system to function effectively and efficiently according to stakeholders' standards. Apparently, Total Quality Management is fairly complex in its ramifications throughout any organization, and particularly in educational settings. It requires careful adoption and application of a set of research-based principles such as the customer's focus, teamwork, open communication, and employees' empowerment, etc.

Principles of Total Quality Management in Education

Research in business, industry and higher education has identified a set of principles that are essential to successful applications of Total Quality Management programs. These principles were drawn up by several notable figures who were significant in the development and adoption of Total Quality Management in various sectors (e.g., Frederick Taylor, G.S. Radford, W.A. Shewhart, W. Edwards Deming, Joseph Juran, & Philip Crosby). However, while each of these pioneers of Total Quality Management define their

essentials differently , there are some common research-based principles and techniques that are proven effective in business, industry and higher education (Sims & Sims, 1995). These principles include but are not limited to: systems thinking, responsiveness to customer's needs, conformance to requirements, doing it right the first time, zero defects, creating constancy of purpose for improving product and services, building quality into the product, institute training and leadership, removing barriers to pride of workmanship, system-wide attitude and commitment to continuous process improvement, and empowering those who are directly involved in doing this job (Banks, 1997; Brown & Hitchcock, 1994; Sims & Sims, 1995; Bonstingle, 1992; Balderston, 1995). This study will highlight, and recommend the following general principles of Total Quality Management that appear to be applicable to educational settings.

Systems Approach to Total Quality Management in education

One of the essential elements of success of Total Quality Management in business and industry has been the focus on systems' performance, and system output's requirements. Sims and Sims (1995) point out that Total Quality Management asserts that 85 percent of total errors result from system errors, only 15 percent are due to individual performance. Total Quality Management is, thus, a systems concept that deals with interacting technical, cultural, and political issues that affect the provision of quality products and services. Research has also shown that the quality of systems, product, and outputs depends largely on the quality of the required inputs and processes, and the interrelationships between them (Kaufman, 1988).

Apparently, all educational activities flow back and forth within the educational systems in a continuous dynamic interaction between means and ends. Moreover, the outcomes of the educational processes are usually influenced by so many factors such as student aptitudes (e.g. abilities, development, and motivation), instructional factors (e.g., quantity, quality, pace, instructional strategies, and delivery systems), and environmental factors (e.g., home, classroom, class size, peers, and media). Total Quality Management in education, therefore, requires that educational systems be viewed as a sum total of inputs and processes working independently and working together to meet customers' needs and satisfaction. It is imperative, therefore, to control the quality of each and every process in the system.

Kaufman (1988) argues that to successfully plan, manage, and improve quality in education is to include the total educational context, not just one or

two slivers of it. Thus, all inputs and processes should operate in concert to achieve the stated mission. Moreover, it is important to control, and assure the quality of all elements of the educational system (inputs, processes, products, outputs, and outcomes). Therefore, a holistic approach to quality control is extremely essential to Total Quality Management in education.

Responsiveness to customers' needs

Another key principle of Total Quality Management is identifying both internal and external customers of the system, and then responding to their needs and satisfaction. As shown in business and industry, quality is usually defined by the customer and, therefore, its management begins and ends with customers. Research has shown that successful organizations appear to have a genuine concern for the clients' success and well being, and pay a great deal of attention to details and quality (Peter, 1987). According to Kaufman, (1988) a caring and abiding focus on customers' needs and satisfaction is a "hallmark" of successful business organizations as well as educational ones. Research also shows that while the supplier values the concepts of performance, reputation, and credibility, customers usually value responsiveness, timelines, competence, and reliability (Crom, 1994). This suggests that organizations need to continuously analyze, and link customers' values and needs to organizational strategies, and communicate these strategies to employees in a form of goals, and expectations (London & Beatty, 1993).

To assure quality management in education, it is extremely important, therefore, to first identify the customers for educational services, and then define their needs. External customers in educational systems are those sectors in the society who receive the system's products and services (e.g. business, industry, military, etc. ...). Internal customers, on the other hand, are those customers within the system (e.g. students and teachers) who receive internal products and services. Sims & Sims (1995) point out that internal customers are usually more important in defining, assessing, and improving all required processes. Thus, it is very important, that everyone in the system should identify his/her customers' standards, monitor and improve all processes that lead to their delight and satisfaction.

Responding to customers' needs requires a continuous flow of information and feedback about customers' perceptions regarding the value of internal products and services, and information about the use of resources and outcomes. In addition, there is a crucial need to establish and document a

customer-supplier relationship between internal and external customers and service units within the educational system. Moreover, it is extremely important to promote accountability and efficiency in the provision of support services.

Students Empowerment

The philosophy of Total Quality Management in Education centers on improving the quality of student learning. There is a crucial need, therefore to empower students to exercise the talents and capacities that the new conceptions of learning outcomes require. McKeachie (1988) argues that, information-oriented societies require a different kind of learner, one who is more of an analyzer, evaluator, and problem solver, one who is able to access and utilize all sources of information, one who has more initiative, more love for learning, and more responsibility for his/her learning. Most educational systems, however, do little to empower students and enhance their intellectual competencies (Lanier & Sedlak, 1989). Learners, instead, are tacitly viewed as passive participants who respond to instruction but do not fully understand, or are not consciously aware of the activities provided for use (Osman & Hannafin, 1992). Research has also shown that extensive teacher-directed explanations rarely require students to draw conclusions, or develop their higher-order cognitive abilities (Weinstein, 1986). Moreover, the quality of schooling has often been determined by obtaining a number of credits, credentials, grade placements and degrees (Lanier & Sedlak, 1989).

Assuring the quality of student learning requires that the purposes of schooling, and achievement measures be clearly defined from the customers' perspectives. It also requires that more emphasis be put on the tools and processes of learning, and not just on academic content, concepts, and skills. Students need to be trained not only on prepositional, and procedural knowledge, but also on conditional knowledge, and the control of associated cognitive processes (Osman & Hannafin, 1992). Research has provided compelling evidence suggesting that effective learners appear to be active information processors who can successfully control and monitor their learning activities (Osman, 1994). Moreover, Osman and Hannafin, (1992) point out that student empowerment requires that the metacognitive capabilities of learners be acknowledged, cultivated, and exploited. It is imperative, therefore, that students be aware of their role in the learning process, and be provided with self-regulation skills so that they can be able to monitor, and regulate their performance, and fine-tune their actions.

Teacher Empowerment

Teacher empowerment is one of the most important elements of success to Total Quality Management in education. Because, as has been demonstrated in business industry, quality control usually lies in the hands of those who do the job. Teacher empowerment refers to teachers' knowledge, efficacy, and professional responsibilities to bring about the desired learning outcomes (Sergiovanni, 1989). It involves a deliberate effort from the part of administrators and supervisors to provide teachers with the help, resources, responsibility, and opportunities to make sensible and informed professional judgment.

Teacher empowerment, thus, goes beyond classroom-bounded definitions of teaching, to include teacher autonomy, and responsibilities for controlling and assuring quality learning. Teacher autonomy, however, is usually overestimated. Because, teachers often have little choice in the instructional materials at their disposal. Moreover, too much attention is usually given to managerially oriented systems of quality control, and not enough to the human factors associated with increased performance (Sergiovanni, 1987). Administrators and supervisors usually represent formidable sources of authority to which teachers have to respond. Performance beyond expectations, however, appears to be a function of peoples' believes and commitment, and is rarely given by subordinates responding to authority. In addition, classroom life is too complex for an outsider to observe, and evaluate. Because so many events occur simultaneously at a given moment, many interests and purposes are served. Administrators and supervisors, therefore, need to be concerned not only what teachers seem to be doing, but also with what teachers believe and think.

Teacher empowerment appears to be a successful means of transforming educational systems into quality systems that produce empowered learners. The following recommendations for empowering teachers are drawn from the current literature in business industry, and higher education (Sergiovanni, & Moore, 1989; Lanier, & Sedlak, 1989; Shulman, 1989; London, 1995; Buckland, Fowinkle, Shroyer, & Rice, 1991; Bonstingle, 1992).

- Teachers should be given responsibilities and discretion over how to go about the business of learning and teaching (e.g. how the curriculum is best arranged and taught, how the learning environment is organized, and what constitute quality instruction, and quality learning, etc.

- Teachers should be provided with the resources, and power to construct and protect an environment that allows students to acquire, and practice higher-order learning.
- Both teachers and administrators should frequently engage in critical inquiry to reorganize, and integrate the curriculum, and determine best ways for more efficient use of human and non-human resources.
- Teacher training must promote generative learning among teachers, where more emphasis is put on continuous experimentation and feedback in an on-going examination of the way they go about teaching, and solving students learning problems.
- Administrators and supervisors must create and encourage a professional atmosphere with high standards, where teachers are encouraged, and rewarded for trying out new ways for controlling, and improving instructional quality.
- Teachers must be able to tolerate their own ignorance, and gracefully reveal the limitations of their own knowledge and abilities. Moreover, they must be provided with opportunities for professional development.
- Teachers must be provided with tools, and opportunities for self-evaluation, and reflection on their teaching processes.

Conclusion

Educational systems are being pressed than ever before to improve the quality of their products. There is a growing demand among the customers of educational systems (e.g., learners, parents, employers, etc.) for a different kind of learner, one who can access, and analyze information effectively, and can reason and think independently. This demand, however, requires a system-wide adoption, and application of Total Quality Management in education. Total Quality Management refers to a data-driven process of continuous improvement that involves quality control, quality assessment, and quality assurance.

Research has provided compelling evidence that Total Quality Management has proven effective in various sectors such as business, industry, military, and higher education. Using business and industry as models, educational systems need to carefully apply the principles of Total Quality Management. Continuous quality improvement, however, should never be an exhortation to urge learners, teachers, or administrators to greater efforts. Instead, it should be a

system-wide attitude, and commitment to performance beyond expectations. The essential elements of success of Total Quality Management in education include, but are not limited to process monitoring and assessment, a holistic approach to quality control and assurance, responsiveness to customer's needs and satisfaction, focusing on system outputs' requirements, and empowering both teachers and students.

Research has shown that quality performance can only be achieved by placing the responsibility for quality control in the hands of those who do the job. Apparently, performance standards and measures in educational settings can not be externally imposed. Instead, they must be accepted and internalized throughout the entire educational system. Every one involved in the educational process should be empowered to do their best, and be asked for proof of quality at each and every step of the process, rather than simply make a final inspection of the final product. To truly excel in the twenty-first century, it is imperative that educational systems become quality-oriented systems, customer-focused, technologically competitive , and adaptive to rapid change.

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Topic 3

Maximization of Students' Achievement through Optimal Time Allocation for the Different Components of an Educational Program

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ABSTRACT

Literature indicates that the questions of curriculum design and teachers' planning have received a substantial amount of attention in educational research and practice and shows that the operations research methods can be used to analyze these topics. It is assumed that education scientists can subdivide specific educational contents into components. They can also specify the sequence in which the different components should be presented. In the case of a curriculum, these components would be courses, while in the case of a course, they would be individual lectures.

The objective of this paper is to analyze curriculum design and teachers' planning for any educational content. Attention will be concentrated on the allocation of the time available for an educational program among its different components in order to maximize the students' achievement. The analysis will be carried out using mathematical programming (optimization) techniques. The following three cases are considered: (i) "Perfect substitutability" which may be more likely applicable to programs whose objective is to teach forms of behavior, rather than a specific subject matter, (ii) "Partial substitutability" which is directly applicable to subjects like "History", (iii) "No substitutability" which is more likely to be found in "Science" and "Mathematics".

Introduction

Among the topics particularly emphasized in the theory of education are curriculum design and teachers' planning of the courses they teach and the lectures and classroom activities they perform. Doll (1), and March (2) provided extensive analyses of the topic. The problems faced by curriculum designers and teachers are also encountered in computer-assisted instruction (3). Curriculum design and teachers' planning exhibit problems similar to those encountered in scheduling the production processes in factories (4). Grandon (5) deals with the problem of allocating the students to existing course offerings.

Plotnicki and Garfinkel (6) analyze the curriculum design that minimizes the time required for the students to graduate. Thus, curriculum design and teachers' planning have received a substantial amount of attention in educational research. This shows also that the methods of operations research and mathematical programming could be used to analyze these topics. No attempt will be made here to define curriculum design or teachers' planning. A study of the literature as represented by, among others, Anderson and Block (7) shows that the design and planning of different aspects of the educational processes have common ideas. A summary of these ideas is presented in this paper. The presentation of Anderson and Block Mastery learning Model of Teaching and Learning is used as a basis for the content of this paper.

Concepts of Curriculum Design and Teachers Planning

Curriculum designers and teachers planning their lectures begin by specifying the objectives of the educational activities with which they are concerned. For this purpose, it should be observed that educational objectives have been classified in three domains, namely; the cognitive, the affective and the psychomotor. The cognitive domain will be used in this paper as the main term of reference. This is not a great loss because educational practice is still to some extent-restricted to this domain (8). The basic methods and conclusions arrived at in this paper are basically applicable to the other domains.

Once content or subject matter is specified, curriculum design and teachers planning proceed to determine the components into which that content should be subdivided taking into consideration its logical consistency. It is assumed that subdivisions in the content of the educational program can be specified.

The next step is the ordering of the components into which the content is subdivided, in such a way that a determination can be made for any one of them of which the other components are prerequisites and which must follow. Thus the sequence in which the components should be presented can be determined.

Finally curriculum design and teachers' planning attempt to specify the amount of time that should be spent on the teaching/learning of each component, taking into consideration the innate abilities of the students and the availability of facilities such as audio-visual aids, laboratories, libraries... etc.

The objective of this paper is to analyze curriculum design and teachers' planning for any educational content. It follows that the aspects of the process dealing with actual content are not considered. It is also assumed that

education scientists can subdivide specific educational contents into components and can also specify the sequence in which the different components should be present.

This paper concentrates on the allocation of the time available for an educational program among its different components, in order to maximize the students' achievement. The importance of this topic is emphasized in the studies by Karweit (9), Smyth (10) and Walberg and Wayne (11). A brief summary of the present status of the analysis of time in education is present below.

Time analysis in Education

As a first attempt for analysis of time in education, a mechanism for computing the student achievement was constructed as follows:

Student Achievement = (the time a student actually spends learning)/(the time he needs to learn) (1)

There is a substantial agreement among educational researchers that little work has been done on how to determine the amount of time the students need in order to learn. Lundgren and Colliander (12) state that "there is little empirical knowledge about curriculum pacing" i.e. about the determination of "the time needed for a group of students to master a given curriculum or a part of a curriculum in the given classroom environment. The authors indicate also that "the majority of studies are rather normative, that is telling what the pacing ought to be rather than studying pacing". On the other hand, a substantial amount of work has been done on the amount of time actually spent on learning. The most comprehensive point of view considers the amount of time both in and out of school that students actually assign to education as a whole. One of the first problems that require attention is the distribution of time among the different components. This topic is not covered by research as it should be. The total educational time for one course includes both the time that the students assign for learning and the time they actually spend within the educational institutions they attend, in addition to the time they spend outside those institutions performing tasks with the same objective. This concept of total educational time is used by Correa and Gruver (13). A review of the literature shows that very little efforts have been put into a systematic analysis of total educational time. Some separate studies have been made on the time students spend on education at home and that spent at school.

Utility and Achievement Functions

It is assumed that the content or subject matter can be subdivided into

clearly defined components. These components would be courses in the case of curriculum or individual lectures in the case of a course. In general, the number of these components is denoted by N. It is also assumed that for each component, there is a function that evaluates student achievement. This function has two uses: First, it indicates the extent to which students have reached the expected level of knowledge as a result of the educational component or course being analyzed, and secondly, it indicates to what extent they have the prerequisites for more advanced study. Students' grades are a real counterpart of this function. It is assumed below that the objective of curriculum designers and of the teachers planning their courses is to maximize an objective function that can generally be represented by:

$$U = f(X_1, X_2, X_3, \ldots, X_N).$$

where, U denotes the utility function, X_I, I = 1, 2, 3, ... N denotes the achievement in component I, with I = N considered to be the highest, and f defines a general function relationship. The instructional time is used by all the components of an educational program or a course, and these components should be presented in sequence. The achievement in one component of an educational program increases as a function of the amount of time devoted to it, and of achievement in its prerequisites. To simplify the mathematical analysis, the influence of other factors of achievement such as the innate abilities of the students, materials, facilities, is not considered. These assumptions are considered in the following model for achievement functions:

$$X_1 = H_1(t_1),\ X_I = H_I(t_I, X_{I-1}),\ I = 2, 3, \ldots, N,$$

where the variable t_I, I = 1, 2, 3, ..., N, represent the time that the students need to achieve the acceptable level X_I in component I, and H_I, = 1, 2, 3, ..., N, denote the function showing the dependence of the achievement X_I on the time t_I used in component I of the curriculum and also on the achievement in the prerequisite component (I - 1). This time does not have to be classroom time, it can be time outside the classroom, with or without the teacher (14). As stated earlier, research is lacking on the specification of educational time needed. At least rough evaluations could be made of the relationship between classroom time and nominal school time. These evaluations could be the basis for actual applications of the concepts provided by the model being developed. Let T be the total time available for the curriculum or for the course, then there is limitation on the sum of the times t_I needed for the N components, i.e.

$$\sum_{I=1}^{N} t_I = T. \qquad (4)$$

We can state that the problem reduces to the maximization of the objective function in equation (2), subject to the constraints in equations (3) and (4). In this respect the analysis presented in this paper is considered as a generalization of the work of Correa (14).

Case I Perfect Substitutability

The objective function in this case is considered to have the form:

$$U = \sum_{I=1}^{N} W_I X_I,$$

where, W_I, I = 1, 2, 3, ..., N are positive weights for the achievement functions X_I, I = 1, 2, 3, ..., N. Their relative values depend upon the relative contributions of the achievement functions to the utility function in equation (5). These weights indicate that for a given component I, an increment of one unit in X_I would increase U by W_I regardless of what happens to the other components. In other words, even if there is zero achievement in all the components except the N^{th} one, i.e. $X_1 = X_2 = X_3 = ... = X_{N-1} = 0$, increments in the achievement function XN of component N would generate increments in the utility function U. Thus the achievement in component N perfectly substitutes for the lack in all other components. If achievement is measured in grades, then the increase in achievement in passing from grade 70 to grade 75 is the same as that obtained in passing from grade 90 to grade 95. For the case under consideration, perfect substitutability implies that the achievement functions could be of the form:

$$X_I = a_I t_I + b_I X_{I-1}, \; I = 2,3, ..., N, \text{ and } b_1 = 0, \text{ so that } X_1 = a_1 t_1. \qquad (6)$$

In general, achievement in the I^{th} component of the curriculum increases proportionally to the time t_I assigned to it regardless of the students' achievement in the prerequisite component for component I measured with achievement in component I-1. Similarly students can achieve in component I only with education in component I-1 without any time being assigned to

cc[illegible]nent I. This would occur in the courses, that, as an extreme, repeat the same material covered in the prerequisite courses. The time constraint in equation (4) is still valid. Equations (6) can be put in the matrix form as follows:

$$X = At+BX, \qquad (7)$$

where, the vector $X = \begin{bmatrix} X_1 \\ X_2 \\ X_3 \\ . \\ . \\ X_N \end{bmatrix}$ the vector $t = \begin{bmatrix} t_1 \\ t_2 \\ t_3 \\ . \\ . \\ t_N \end{bmatrix}$

the matrix $A = \begin{bmatrix} a_1 & & & & & & \\ & a_2 & & 0 & & & \\ & & a_3 & & & & \\ & 0 & & & & & \\ & & & & & & \\ & & & & & & a_N \end{bmatrix}$, and

the matrix $B = \begin{bmatrix} 0 & & & & & & \\ b_2 & 0 & & & & & \\ & b_3 & & 0 & 0 & & \\ & & b_4 & 0 & & & \\ & 0 & & & 0 & & \\ & & & & b_{N-1} & 0 & \end{bmatrix}$

Equation (7) reduces to (I-B)X = At, which can be easily simplified to:

X = Ct,

where, I is the unit matrix, the matix C = (I - B)-1 A, and the matrix $(I - B)^{-1}$ is the inverse of the matrix (I-B). The matrix C is given by:

$$C = \begin{bmatrix} a_1 & 0 & & & \\ a_1b_2 & a_2 & & & \\ a_1b_2b_3 & a_2b_3 & a_3 & & \\ a_1b_2b_3b_4 & 0 & a_3b_4 & a_4 & \\ \vdots & & & & \\ \prod_{I=2}^{N-1} a_1 b_I & & & & \\ \prod_{I=2}^{N} a_1 b_I & & & a_{N-1}b_N & a_N \end{bmatrix}$$

The general entry of the matrix C is give by:

$C_{I,I}=a_I$, $C_{I,J}=0$, $I < J$, and

$$C_{I,J}=a_J \prod_{K=J+1}^{K=I} b_K, \quad I \neq J,\ I > J,\ I = 1, 2, 3, \ldots, N,\ J=1,2,3, \ldots, N. \qquad (9)$$

Therefore the J^{th} element of the vector X is given by:

$$X_J=a_Jt_J + \sum_{I=1}^{I=J-1\neq 0} a_It_I \prod_{K=I+1}^{K=J} b_K, \quad J>1,\ J=1, 2, 3, \ldots, N, \qquad (10)$$

and $X_1=a_1t_1$.

For the case of N = 3, equation (10) reduces to:

$X_1 = a_1t_1$,

$X_2 = a_1b_2t_1 + a_2t_2$,

$X_3 = a_1b_2b_3t_1 + a_2b_3t_2 + a_3t_3$.

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Invoking the values of the achievement functions X_J given by equation (10) in equation (5), the utility function for the case of perfect substitutability can be expressed in terms of t_I only as follows:

$$U = \sum_{J=1}^{N} W_J \left\{ a_J t_J + \sum_{I=1}^{I=J-1\neq 0} a_I t_I \prod_{K=I+1}^{K=J} b_K \right\} \qquad (11)$$

Since our objective is to maximize the utility function U, the component I for which t_I has the largest coefficient, should be assigned the total available time T, while the other components should be assigned zero time. Therefore the specific component that is assigned the total available time T, depends upon the values of the parameters a_I, I = 1, 2, 3, ..., N, and the value of b_I, I = 1,2,3, ..., N. For the special case of N = 3, equation (11) can be written as:

$$U=a_1 (W_1 + W_2b_2 + W_3b_2b_3) t_1 + a_2 (W_2 + W_3b_3) t_2 + a_3W_3t_3, \qquad (12)$$

so that,

$t_1 = T$ when $a_1 (W_1 + W_2b_2+W_3b_2b_3) > a_2 (W_2+W_3b_3)$ and W_3a_3, (13a)

$t_2 = T$ when $a_2 (W_2 + W_3b_3) > a_1 (W_1 + W_2b_2+W_3b_2b_3)$ and W_3a_3, (13b)

$t_3 = T$ when $W_3a_3 > a_1 (W_1 + W_2b_2 + W_3b_2b_3)$ and $a_2 (W_2 + W_3b_3)$. (13c)

Investigation of the results in equations (13) makes it possible to specify the effect of changes in the values of the parameters of the objective and achievement functions. An increment in the values of a_1 makes it more likely that t_1=T. This is justified in equation (13a) showing that an increment of a_1 increases only the left-hand side of the inequality i.e. the likelihood that the total time will be assigned only to component # 1, i.e. t_1 = T. Consequently this reduces the likelihood that any time will be assigned to t_2 and t_3. Figure 1 is a schematic diagram for the determination of the time assigned to the components of the educational program to maximize the utility function.

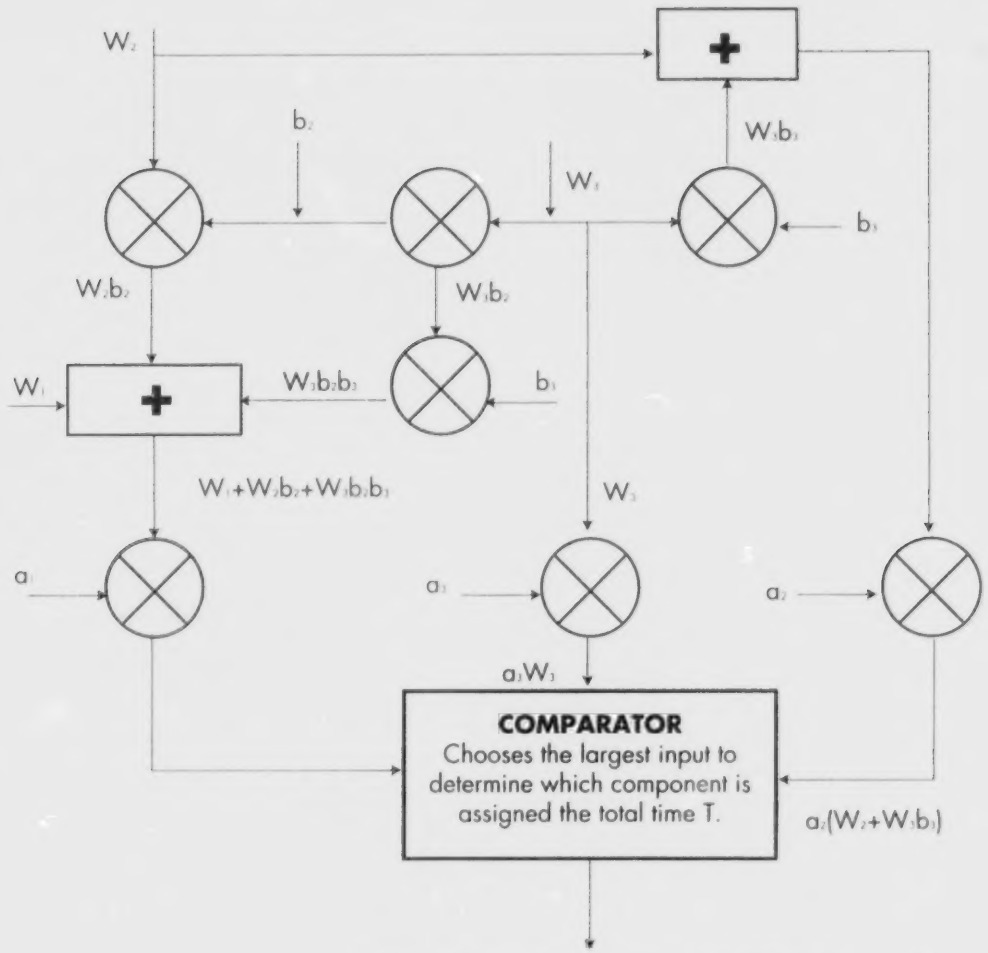

Figure 1. Determination of the time assigned to each component of the educational program to maximize the utility function, case of "Perfect Substitutability".

Case II Partial Substitutability

In this case, some achievement in each of the components in which the subject matter has been divided is needed in order to obtain a positive value for the utility function U, if the achievement in any of the components is zero, then the utility function U will have a zero value regardless of how high the achievement in the order components is. Consequently, the suggested utility function will have the form:

$$U = W_0 \prod_{I=1}^{N} X_I^{W_I} \qquad (14)$$

The achievement functions will also have the form:

$$X_l = C_l \; t_l^{a_l} \; X_{l-1}^{b_l}, \quad l = 2, 3, \ldots, N, \tag{15}$$

and since the first component has no prerequisites, i.e. the achievement function in it will depend only on the time used in it, then,

$$X_1 = C_1 \; t_1^{a_1}$$

Invoking the expressions for the achievement functions in the utility function, it can be easily written in the form:

$$U = W_0 C_1 t_1^{a_1} \prod_{l=2}^{N} C_l^{W_l} t_l^{a_l W_l} X_{l-1}^{b_l W_l} \tag{16}$$

Therefore, the determination of the optimal distribution of time in the case of partial substitutability reduces to the maximization of the utility function U given by equation (16). Since the logarithmic function is a monotonically increasing function of its arguments, then the maximizaion of the utility function U will lead to the same results as the maximization of the function Log U which can be written in the form:

$$\text{Log } U = D \sum_{J=1}^{N} W_J \left\{ a_J \text{ Log } t_J + \sum_{l=1}^{l=J-1 \neq 0} a_l \text{ Log } t_l \prod_{K=J+1}^{K=J} b_K \right\} \tag{17}$$

where D is a constant depending on the parameters a_l, b_l, c_l, and W_l, $l = 1, 2, 3, \ldots, N$

Maximization of the utility function in equation (17) subject to the equality constraint of the total time; i.e. $T = t_1 + t_2 + t_3 + \ldots + t_N$, is accomplished using a common method in the calculus of variations (15) by introducing the Lagrange multiplier λ and forming the new function G given by:

$$G = \text{Log } U + \lambda (T - t_1 - t_2 - t_3 - \ldots - t_N), \tag{18}$$

which attains its maximum value at the values of t_l $l = 1, 2, 3, \ldots, N$ given by:

$$\partial G / \partial t_l = 0 \qquad l = 1, 2, 3, \ldots, N,$$

where $\partial G/\partial t_l$ are the partial derivatives of the function G with respect to t_l, l = 1, 2, 3, ..., N. In fact equation (19) represents N equations in N unknowns, namely t_l l = 1, 2, 3, ..., N. These equations can be solved (16) to find the values of the time that should be assigned to each of the components of the curriculum in order to maximize the utility function. For the case in which the curriculum is subdivided into three components only, the results of maximization would be as follows:

$$t_1 = (P/S)\,T, \qquad t_2 = (Q/S)\,T, \qquad t_3 = (R/S)\,T, \qquad (20)$$

where $P=a_1 (W_1+b_2W_2+b_2b_3W_3)$,

$Q=a_2 (W_2+b_3W_3)$,

$R=a_3W_3$,

$S = P + Q + R$.

Investigation of the results obtained in equation (20) shows that in the case of partial substitutability, time should be assigned to each of the components in which the curriculum is subdivided, so long as the parameters of the utility and achievement functions have nonzero values. Comparing with equation (12), it is obvious that, for the case of partial substitutability, the amount of time for each component is proportional to the combinations of parameters that determined whether time should be assigned to only one component in the case of perfect substitutability. It is also to be noted that the changes in the parameters of the achievement functions in equation (15) give results that are quite similar to those obtained in the case of perfect substitutability. A final remark is that the signs of the partial derivatives of the utility function in equation (17) with respect to time, indicate that additional time should be assigned to the components in which the productivity of time is higher. This conclusion is reasonable as long as it is assumed that there is some substitutability among the components. Figure 2 is a schematic diagram for the determination of the time assigned to the components of the educational program to maximize the utility function.

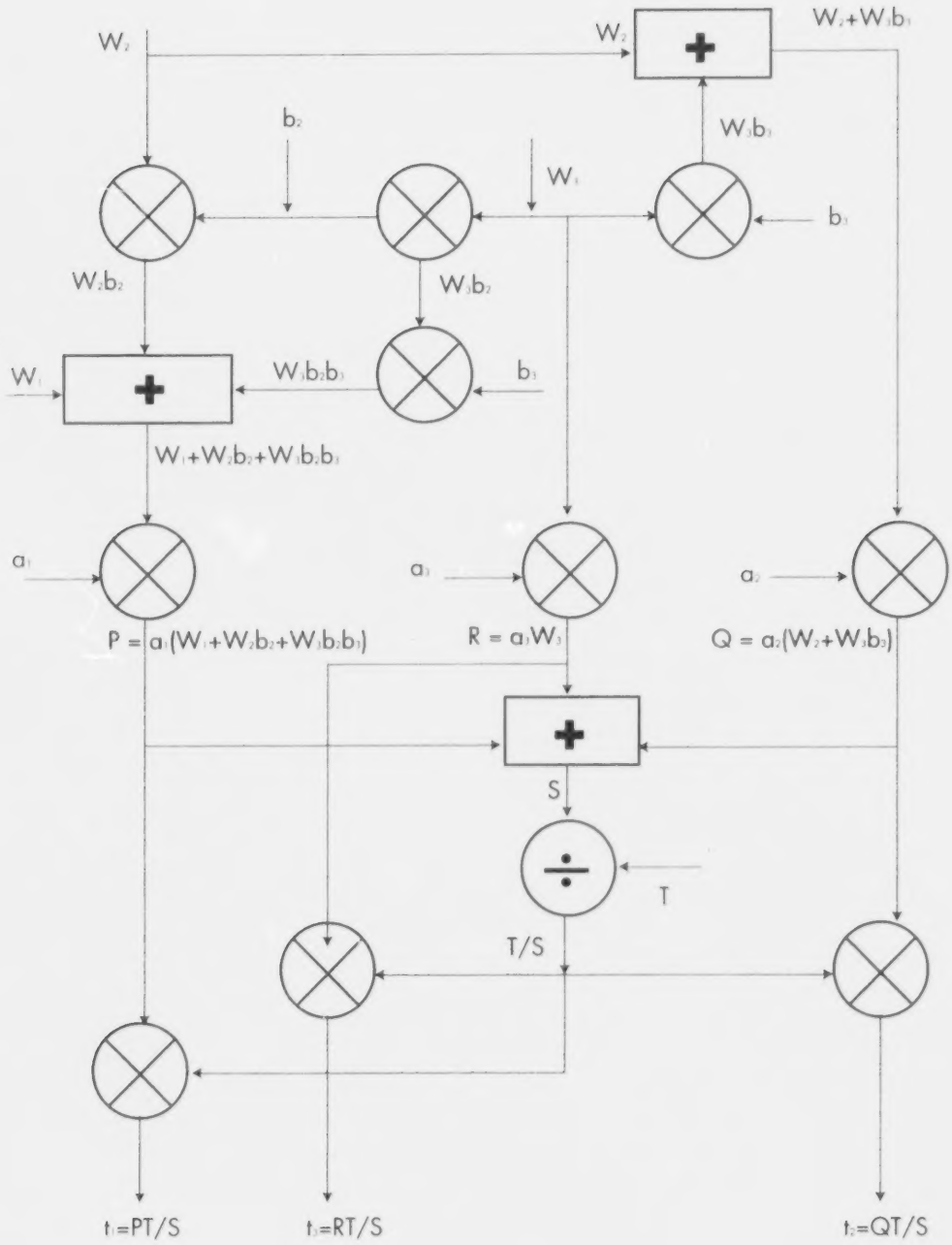

Figure 2. Determination of the time assigned to each component of the educational program to maximize the utility function, case of "Partial Substitutability".

Case III No Substitutability

In this case, the achievement functions may be of the form:

$$X_l = A_l t_l, \qquad l = 1, 2, 3, \ldots, N. \tag{21}$$

The analysis of the achievement functions shows that once the limit imposed by the achievement function X_l is reached, X_{l+1} cannot increase, regardless of the amount of time assigned to it, so that we can write:

$$Xl \leq bl\ Xl\text{-}1, \quad l = 2, 3, \ldots, N. \tag{22}$$

If $X_m = b_m X_{m-1}$ and $t_m > b_m X_{m-1}/a_m$, a part of t_m, m=2,3, ..., N would be wasted. Therefore, the objective function has no influence on the distribution of time among the different components of the curriculum being analyzed. The constraint on the total time is still the same. From these observations it follows that for an efficient use of time, the values of t_l, l = 1, 2, ..., N, should be increased up to the point where each inequality in equation (22) becomes an equality. Therefore one has a system of 2N linear equations; N equations in (21), N-1 equations in (22), and one equation representing the time constraint. The number of unknowns is 2N+1, N for each of t_l and X_l and one for T. This means that all the t_l's and the X_l's can be expressed in terms of T. For the case of N=3, one has the following six equations:

$$X_1=a_1t_1,\ X_2=a_2t_2,\ X_3=a_3t_3,\ a_2t_2 \leq b_2X_1,\ a_3t_3 \leq b_3X_2,\ t_1+t_2+t_3=T$$

Considering the equalities, one has six equations in seven unknowns; three t_l, l=1,2,3, three X_l l=1, 2, 3, and T. Therefore the time to be assigned to each of the components will have the values given by the following equations:

$$t_1=a_2a_3\ T/H,\ t_2=a_1a_3b_2\ T/H,\ t_3=a_1a_3b_2b_3\ T/H, \text{ where,} \tag{23}$$

$$H = a_2a_3+a_1a_3b_2+a_1a_3b_2b_3.$$

Equation (23) can also be used to study the effect of changes in the parameters of the achievement functions on the amount of time that should be assigned to each component of the curriculum. For instance, an increment in the productivity of the time assigned to X_l, i.e. a positive increment of a_l reduces the amount of time assigned to that component. Since a change of a_l from a lower to a higher value means that X_l becomes easier to learn, this is interpreted to mean that less time should be assigned to the components of the curriculum that are easier to learn, a conclusion which is quite reasonable. Figure 3 is a schematic diagram for the determination of the time assigned to the components of the educational program.

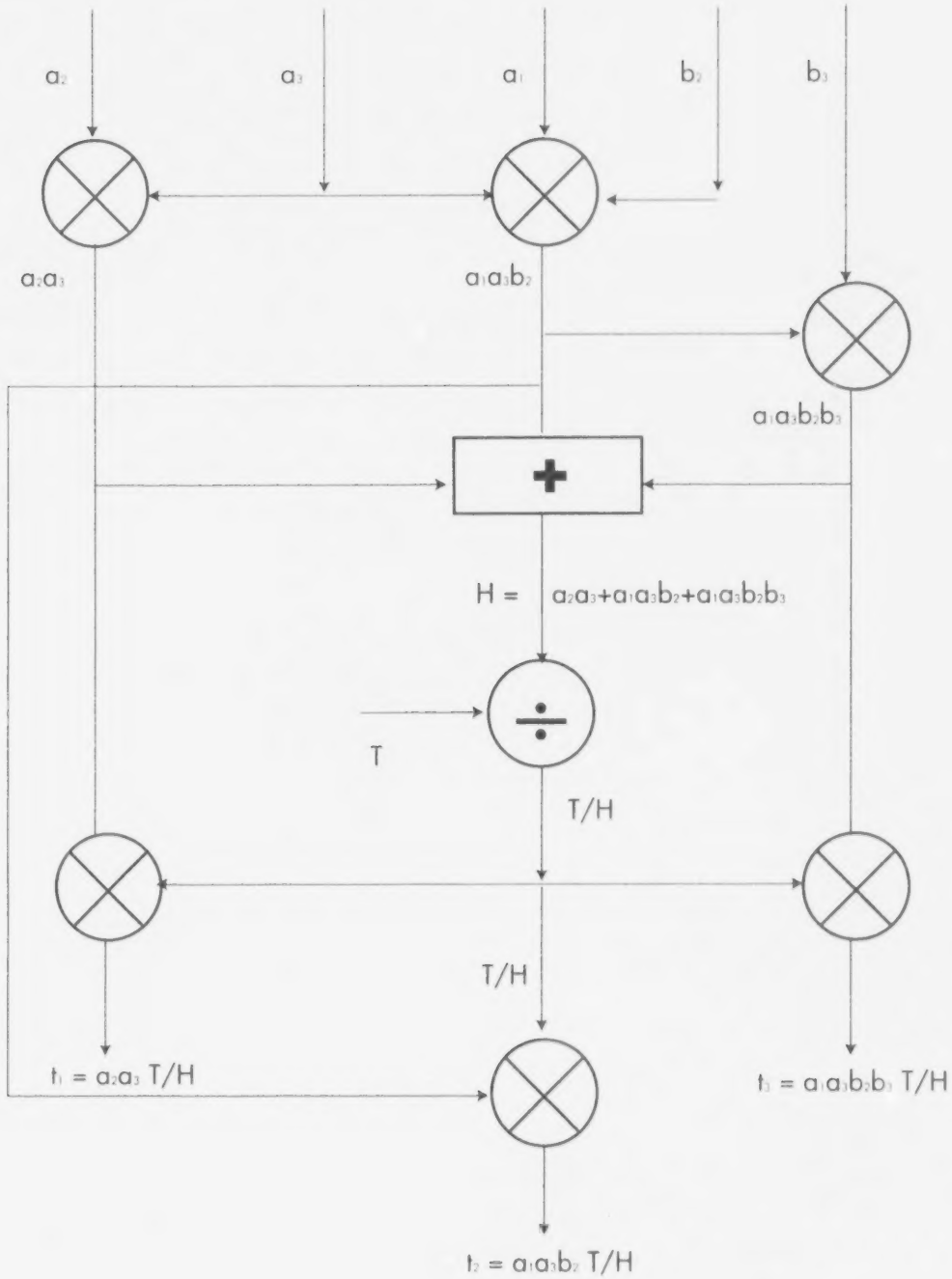

Figure 3. Determination of the time assigned to each component of the educational program, case of "No Substitutability".

Conclusions

Depending on the objectives and the characteristics of the educational program or the course, different strategies should be used with respect to the allocation of the time to the different components of the content. For *Perfect Substitutability,* all the time available should be devoted to one of the components of the content. For *Partial Substitutability,* the most efficient use of the time available is obtained when some time is assigned to each component. In the case of *No Substitutability,* there is only one way to use the time available. This indicates that it is particularly important to classify the objectives and components of the educational program with one of the three groups listed above. The case of Perfect Substitutability may be applicable to programs whose objective is to teach forms of behavior rather than a specific subject matter. Subjects like "Geometry" or "Language Structures" may be taught to help students to learn how to think and the importance of perseverance. If the objective of this type of instruction is not teaching of specific subject matter, it follows that any component will do while all other components are eliminated. An example of subjects included in the category of Partial Substitutability is "History". History is usually taught as time periods or political units. It is true that at some point, the time used in developing knowledge about one component will have decreasing productivity. That time could be used more efficiently in other components. The closest example of No Substitutability is "Mathematics" and "Computer Sciences". Without appropriate knowledge of the prerequisites, a specific component of the subject cannot be mastered, which means that there is very little choice with respect to the distribution of time available among the components for a course in "Mathematics".

In this paper, only two of the facts of effecting students' achievement are considered, namely; knowledge of the prerequisites and time assigned for teaching and/or learning. Other factors like innate abilities and education of teachers, innate abilities of the students, materials and facilities, etc., should be considered in any future research in this area. The analysis presented in this paper, is restricted to the form of dependence of both the utility and achievement functions on their arguments. Although the choice of these functions in the present analysis is justified, other forms should be explored.

Nomenclature

N Number of components in which the contents or subject matter is subdivided.

U Utility function.

X_I Student achievement in component I, I = 1, 2, 3, ..., N.

f A function showing the dependence of the utility function upon the achievement functions.

H_I A function showing the dependence of the achievement function of component #I on the time t_I assigned to it, I = 1, 2, 3, ..., N, and on the achievement in the prerequisite components.

t_I The time that the students need to achieve the acceptable level of achievement X_I in component #1.

T Total time available for the curriculum or for the course.

W_I A positive weight for the achievement function X_I, I = 1, 2, 3, ... N.

a_I Coefficient of t_I in the expression for the achievement function X_I, I = 1, 2, 3, ..., N.

b_I Coefficient of X_{I-1} in the expression for the achievement function X_I, I = 1, 2, 3, ..., N.

I The unit matrix.

A A diagonal matrix whose I^{th} diagonal element is a_I, I = 1, 2, 3, ..., N.

B A matrix with zero entries except for the first subdiagonal elements. The I^{th} entry is b_{I-1}.

$(I-B)^{-1}$ is the inverse of the matrix (I-B).

C A matrix which is equal to $(I-B)^{-1}$ A.

W_0 A scale factor of the utility function U in the case of partial substitutability.

C_I A scale factor of the achievement function X_I (partial substitutability), I=1, 2, 3, ..., N.

D A constant depending on the parameters a_I, b_I, CI, W_I, I = 1, 2, 3, ..., N.

λ Lagrange multiplier number.

G A function obtained by introducing the Lagrange multiplier number.

$\partial G/\partial t_I$ The partial derivative of the function G with respect to the time variable t_I, I = 1, 2, 3, ..., N.

P, Q, R, and S, constants depending on the coefficients of the time variables, coefficients of the achievement functions and their weights.

H A constant depending on the coefficients of the time variables tI, and also on the coefficients of the achievement functions X_I, I = 1, 2, 3, ..., N.

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Validity of Evaluation
(Testing and Grading)
In the English Department and Language Centre at Sultan Qaboos University

(Topic # 3)

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Topic # 3. Validity of Evaluation (Testing and Grading) In the English Department and Language Centre at Sultan Qaboos University

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The test body for this study consisted of ninety second year (sophomore) English Education Specialists at Sultan Qaboos University. Upon entry to the university, these students had been streamed using the PET (Preliminary English Test). In the middle of the second year they were retested with te PET. At the start, middle and end of the second year they were given the CELT (Comprehensive English Language Test). Statistical studies were run comparing the PET and CELT scores with each other and the scores from both tests with the grades students had received in English courses. The study sought to determine the rate of student progress as measured by the CELT and the PET (both as achievement and as proficiency test), the predictive validity of the PET and CELT measured against student grades, the validity of the skills components of the PET measured by grades in courses requiring such skills, the apparent objectivity of grading on a subject by subject basis, and the extent to which the grading system rewarded improvement in language ability. The paper recommends that, since student evaluation is such an important part of their job, many university teachers could benefit from instruction in testing principles and practice.

The test body for this study consisted of ninety English Education Specialists at Sultan Qaboos University, in The Sultanate of Oman. These students had entered the university in fall, 1993. The study was conducted in the academic year 1994-95, after the students had completed one year in the Language Centre and were enrolled in their first year in the English/Education Department. Upon entry to the University, these students had been given the PET (Preliminary English Test) and, on the basis of their scores, had been streamed into five groups of three levels, as follows: groups D & E – BAND I; groups B & C – BAND II; group A – BANDS III & IV. The students remained in these groups throughout their academic program. In January, 1995, these

students were re-tested with the PET (as a proficiency test). The students were given the grammar component of the CELT (Comprehensive English Language Test) at the beginning, middle and end of the academic year 1994-95. For control purposes the following additional groups of students were administered the CELT – 1994 English Education Specialists; 1993, 1992, & 1991 English Arts Majors; 1993 Archaeology Arts Majors.

During the academic year 1994/95 English Education Specialists took four English courses per semester. There was a two semester literature sequence (3 credits, 3 contact hours per semester); a two semester sequence in linguistics (3 credits, 3 contact hours per semester); a two semester sequence in writing and grammar (3 credits, 6 contact hours per semester); a two semester sequence in reading and vocabulary (3 credits, 6 contact hours per semester).

For the purpose of this paper, the following terminology applies: "group" means the initial streamed groups set by the Language Centre, as determined by the PET. There were five groups. "Course" means the subject matter taught in the program. There were eight courses. "Class" means the particular students in the classroom. There were forty classes, with around fifteen students in each class. The classes were taught by a total of 15 teachers, as follows: reading – 8; writing – 7; literature – 5; linguistics – 4; phonetics – 2. (Some teachers taught more than one subject.) Three teachers taught just one class apiece; six taught two different classes; one taught three different classes; three taught four different classes; two taught five different classes. Since all courses were taught by at least two teachers, data regarding grading patterns may be considered, to a reasonable degree, teacher independent. The greater the number of teachers teaching a particular course, the more teacher independent such data would be.

Statistical studies were run comparing the PET and CELT results with each other; and the results from both tests with grades which students had received in English courses during the year under investigation. These studies sought to determine the following: overall student progress, as measured by the CELT and by the PET (as proficiency and as achievement test); student progress on a group by group basis (to determine the success of individual programs of study); the validity of the initial grouping, as determined by the PET; the predictive validity of the PET and the CELT, measured against student grades; the predictive validity of the skills components of the PET, measured against grades in courses which would appear to require such skills; the apparent objectivity of grading, on a subject by subject and teacher by teacher basis; grading profiles of individual teachers; the extent to which variations in

performance on an objective instrument could explain variations in teacher perceptions of individual students; the extent to which the grading system identified and rewarded improvement in language ability.

Progress According to the PET

During the five years (1990-95) in which the PET was used by the Language Centre, it performed a variety of functions, the first of which was as a proficiency test to determine the level of English of students entering Sultan Qaboos University. Since, in most colleges, courses are taught in English, this information was important. According to the Language Centre, based on five years of data, the mean level of students entering the university is equivalent to lower IELTS BAND 2 (c. 2.3). This level is not normally considered adequate to study university level material in English. (In Britain and America, a level of IELTS BAND 6 of equivalent is usually required for university entrance.) Clearly, therefore, it was necessary for the Language Centre to conduct some sort of remedial program.

The second function of the PET was as a streaming test. In order to accomplish this function, an agreement was established between the UCLES and the university providing for certain modifications to the PET. These included: A. changing the name of the instrument from "Preliminary English Test" to "Placement English Test", B. eliminating the speaking component from the exam and re-distributing the points for this section between the other sections of the test; C. dividing both the passing and failing grades into additional "BANDS" (The test had been originally designed as a PASS/FAIL instrument set at the start of IELTS BAND III.); D. assigning the IELTS descriptors to the four BANDS created by the division described above. (This step was significant because the descriptors could influence course descriptions and course goals.) The modified PET was used as a streaming test from 1990-1995. Results of the streaming varied from college to college and somewhat from year to year. From time to time, the break level between BANDS I and II was re-adjusted. However, the overall approximate figures were PET BAND I-40%; BAND II-40%; BAND III-15%; BAND IV-5%.

For a brief time the PET was used as an exit proficiency test. It was first used for this purpose in 1993, for College of Commerce students who had entered the university in fall 1992. The Language Centre had adopted from the British Council the determination that it would take an average student two hundred contact hours of instruction the improve one IELTS BAND level. (A fifteen week semester of eighteen contact hours per week, which amounts to 260 hours,

minus time for tests, quizzes and registration procedures, approximates this condition.) Unfortunately, according to Language Centre figures, only one out of 60 students went from BAND III to BAND IV in a period of one semester.

The Language Centre undertook various measures to deal with this situation. First, a different reading passage was introduced, to make the test more "culturally relevant". Second, a teacher with computer expertise loaded the entire test on the computer, isolated all the vocabulary items, and devised exercises to teach these particular vocabulary items. Through the use of such measures, PET as proficiency test (a random measure of language ability) was transformed into PET as achievement test (measuring mastery of some specified curriculum). Once PET had been transformed from a proficiency test into an achievement test, over 95% of students were able to reach BAND IV in a single semester of study.

For the test body of this study, PET was also used as a proficiency test. The students were given the PET one and a half semesters after they had initially taken the streaming test. Between the first and second sittings, the students had taken 780 hours of language instruction. However, for this particular population, it was not necessary for students to have achieved BAND IV to continue with their programs. Table #1 shows the improvement between the two sittings of the PET, on a BAND by BAND basis.

Table 1 (BAND by BAND Improvement)

Pre-Test to post test score	# Students
IV to IV	3
III to IV	9
III to III	3
II to IV	6
II to III	22
I to IV	2
I to III	26
I to II	1

There has clearly been improvement. However, only 24.6% of students achieved BAND IV in the three semester period. Six students remained at the same BAND level. (It should be noted that PET does not record beyond BAND IV.) Thirty two students improved by one BAND level; thirty two students improved by two BAND levels. Only two students improved by 3 BAND levels, which is the rate considered normal when the PET is used as an achievement

test, and the curriculum is adjusted to meet this exit requirement. The average student improved during this time by 1.4 BAND levels or at a rate of 559 contact hours for each BAND level of improvement. The above data confirm the results that, when BAND IV was initially introduced as an exit requirement in the College of Commerce program, students had considerable difficulty reaching this level. Furthermore, the above figures refer only to the "average" student, not 95% of the population.

There may be several interpretations of the above data. There may be problems with the content validity of the PET, or the extent to which the test adequately samples the body of knowledge to be tested. This may be particularly of BAND IV, which was outside the domain of optimum reliability of the test. It is also possible that, when there is some specific exit requirement as a target for students to aim toward, their motivation and rate of language improvement improves. Whatever the explanation, the above data suggest that a term like "BAND IV" does not have a consistent meaning. Perhaps one should distinguish between "Proficiency BAND IV" and "Achievement BAND IV".

Improvement according to the CELT

According to Rebecca Oxford (Alderson, pp. 22-24), the CELT is suitable for measuring student improvement. The CELT was administered at the beginning, middle and end of the second year, during the time students were taking courses in the English Department. Since the teachers were unaware of the content of the test, and since achievement of any particular level on this test was not a requirement for the program, this test could be considered a proficiency test. The mean scores between the pre-test and the mid-test, the mid-test and the post-test and the pre-test and the post-test were determined for the total population as well as for the population on a group by group basis. The standard deviation for the entire population and for each group was also determined for each test. The statistical significance of the changes in mean score was then determined through t-tests. The statistical significance of the changes in mean score was then determined through t-tests. The chart in Appendix 1 shows mean scores for the three testings, standard deviations and the statistical significance of the changes in score on a group by group basis.

The mean for all students at the first testing was 42.92; the mean for the second testing was 47.06, an increased of 4.14 points. The statistical significance (p) of the increase, calculated independently for all students, was 0.000. These figures indicate that actual learning did take place. At the third testing, the mean was 50.53, an increase of 3.47 points over the second

testing; the p value for this difference was 0.000. For the entire year, the increase was 7.14 points. The p value for the difference between the first and third testings (determined separately) was 0.000.

Variation in performance between the five groups was considerable. For group A, the increase was 6.33 for the first semester; the statistical significance (p) of this change was 0.000. For the second semester, the increase was 3.94 points; p for the change during this period was 0.006. For the entire year this group improved by 10.28 points; p for the entire year (determined separately) was 0.000. This increase in mean score was supported by a high level of significance, indicating that students in this group (A) did learn a substantial amount throughout the year.

Groups B and C performed almost identically, both in rates of increase and in statistical significance. The yearly increase for B was 5.77; for C, 5.13. These figures are around half the increase for A. The figures for statistical significance confirm this difference. For the first semester, the significance for the two groups was p=0.022 and 0.018 respectively. For the second semester, the p values were 0.166 and 0.168 respectively. These figures suggest that, for groups B and C, little if any learning took place, in particular during the second semester. For both groups in the second semester, the modest increase in mean score could be attributed to the margin of error of the test.

Groups D and E performed somewhat differently. In the first semester, group D increased by an above average 4.73 points, with p = 0.000. In the second semester, group D slowed down somewhat, with an increase of 2.93 points, with p = 0.019. Learning did take place in both semesters, but at a somewhat slower rate in the second semester. Exactly the opposite happened with group E. In the first semester, the increase was a dismal 1.8 points, with p = 0.270. Since such figures are not considered significant, this indicates that little if any learning took place. However, in the second semester, the figures jumped up to an above average 4.45 point increase, with p = 0.002, which is highly significant.

The patterns of change in standard deviation are also important. In the initial testing, the standard deviation for group A was high, at 8.26 while, for groups B through E, the standard deviations were almost identical, at 5.94, 5.82, 5.49 and 6.15. This pattern can be explained by the fact that group A was originally formed from both BANDS III and IV in the initial PET testing. Hence this group was more heterogeneous at the start. (Groups B and C were formed from PET BAND II; Groups D and E were formed from PET BAND I.)

As the test were repeated throughout the year, the standard deviation of group A steadily declined, from 8.26 to 7.99 to 6.67. By the end of the year, the standard deviation for this group was actually lower than that for most of the other groups. A decrease in standard deviation could imply that members of the class were receiving equivalent benefit from the instruction. If the testing measured material actually taught, the range in class performance could progressively diminish.

For groups B through D the standard deviations steadily increased throughout the year, as follows: B – 5.95, 6.06, 7.47; C – 5.82, 6.77, 6.92; D – 5.49, 7.09, 7.17. An increase in standard deviation may indicate that the class is becoming more disparate or fragmented, with a limited number of students benefiting from the instruction while other students receive no benefit at all. This may be particularly true if there is a small increase in mean score, which could be attributed to a couple of students. Future testing should determine the statistical significance of such changes.

When there is an increase in mean score accompanied by an increase in standard deviation and reasonable statistical significance, as happened with group D, all students may be learning but some may be learning more quickly than others. Testing may emphasize differences between students rather than uniform attainment of some "mastery level". For this group the standard deviation in the second semester showed almost no change, indicating that the mean learning curve had stabilized.

The behavior of group E was almost the opposite of that of group D. During the first semester, the improvement in mean was insignificant. But this was accompanied by a marked decrease in standard deviation, suggesting that the group was coming together. In the following semester, the increase in mean grade was statistically significant.

According to all three parameters measured (mean, standard deviation and statistical significance), the performance of the five groups varied markedly. Such variation in performance could be attributed to various factors, including differences in teacher, variations in program and variations in the initial streaming of the students. Since group A was initially formed from students who did better on the initial PET test, one would naturally assume that thee were better students. But can the differences noted above be attributed entirely to this cause? According to the initial streaming, groups B and C should have performed better than groups D and E. However, the above data indicate that the performance of groups B and C was consistently mediocre throughout the

year, with little evidence of improvement. The performance of groups D and E, while erratic, was better than that of B and C. Such results are the opposite of what one might expect from the initial groupings. Hence, while the initial grouping may explain part of the performance of group A, it does not explain the other data.

The course which probably had the greatest impact on the CELT scores would have been the Language Development sequence, which emphasized grammar and writing. Although generally such courses tend to be closely coordinated, in this particular year, on an experimental basis, different teachers employed different programs and methodologies. The teacher who taught group A for both semesters used a mastery learning approach based on extensive grammar drills. The teacher for groups D and E used a traditional grammar/writing approach. The teacher(s) for groups B and C used a holistic pure writing approach in which students were expected to infer the rules of the language from their success or lack of success in achieving communication. Clearly, these different approaches had varying impacts on the scores on the proficiency exam.

CELT Performance of Control Groups

The term "control group" in this paper means simply groups of students who were not part of the intensive comparasion study.

A. 1994 English Education Specialists

In September, 1995, the CELT was administered to all 1994 English Education Specialists upon entry to the English Department. This group entered the university one year later than those studied in detail. The program for the 1994 students differed in one important aspect from the program for the 1993 English Education Specialists. The 1994 English Education Specialists were required to obtain BAND III on the CELT before they could enter the two semester 18 contact hour sequence of credit courses taught in the Language Centre. Since most such students entered the University at lower BAND II, they were required to take one additional semester of 18 contact hours of pre-credit remedial language study to reach the required level. The results of this testing session are shown in Appendix 1.

The mean for the 1994 students was 47.10, and the range was a substantial 37 points. For the 1993 students, the mean for CELT 2, taken in January, was 47.06. In other words, the 1994 students were at the same level in September that the 1993 students had reached by January (one semester

later). Between September and January the 1993 students had taken one semester of 18 contact hours of language study in the English Department. However, the 1994 students had taken an extra semester of 18 contact hours within the Language Centre in order to reach the required BAND III. In other words, both groups had taken an extra semester of 18 contact hours, one in the English Department and one in the Language Centre.

Since the mean scores for these two groups are virtually identical, this would indicate that, when students are taking an 18 contact hour program of full time language study, the average rates of improvement for the English Department and the Language Centre are equivalent. Indeed, there may be greater variation in rate of improvement between groups within the English Department than between the English Department and the Language Centre as a whole. Since this is potentially a significant conclusion, further tests should be run to see if it can be verified. However, it may be difficult to do so since the Language Centre and the English Department rarely teach equivalent or overlapping courses. Determination how this rate of improvement stands on an international scale would depend on obtaining equivalent information for rates of improvement for the CELT.

B. Arts Archaeology Majors

With the inclusion of the BAND III requirement, English Education Specialists take 810 hours of language instruction during the first year (including the summer session). On the other hand, students in Colleges identified as Arabic Medium Colleges take only six hours per week or a total of 180 contact hours of English during the first year. However, several major subjects within these Colleges, even if not taught exclusively in English, require English for reading text books or doing research papers. One such major subject is Archaeology. In September 1994, the 1993 Archaeology students were given the CELT. The number of students was 13. The mean score was 34.73, or around 12 points lower than the average CEIS student. Based on the average rate of improvement in the CELT, it would take just over three semesters of full time language study for these students to reach the level of the CEIS students. This level of English would appear to be inadequate for academic purposes.

C. Arts English Majors

Until the academic year 1996-97, Arts English majors took the same program as all other Arts majors, which consisted in the first year of a sampling of courses taught by the various Departments in the College. This program

served two purposes – to provide a broad liberal arts background and to acquaint students with the various Departments within the College so they could make an informed choice of major. All students within the College took only six contact hours per week of English language skills courses. In the second semester of the Freshman year, all Arts students also took an elementary literature course. All Arts students declared their major at the beginning of the second year. Arts English Majors then embarked on a program emphasizing literature and linguistics.

For several years the English Department sought to allow potential English majors to declare their intention to study English upon entering the University so they could take the same language skills courses in the Freshman year that the Education English Specialists were taking. The program requested by the English Department was finally established in 1996-97. Since the tests on which this study are based were run in 1994-95, all the Arts English Majors tested were members of the so-called "old program," in which they studied only 180 hours of language skills courses with the Language Centre during the first year.

Arts English majors from 1992, 1993 and 1994 were given the CELT. At the time of testing, the 1992 students were beginning their senior year, the 1993 students were beginning their junior year and he 1994 students were beginning their sophomore year. The figures are shown in Appendix #1. These figures should be treated with caution. The sample sizes are small, and no one group was re-tested over a period of time to determine actual progress. Nevertheless, one could make the following observations. The data indicate that Arts English majors at the start of their fourth year were apparently at the same level as 1994 English Education Specialists at the start of their second year and one semester behind the 1995 English Education Specialists at the start of the second year. This can be explained in part by the fact that the English Education Specialists take a substantial program of language skills courses (810 hours) in the Freshman year whereas the Arts English Majors take only 180 hours of language skills courses during this time.

The Arts English Majors are clearly more heterogeneous than the English Education Specialists. For the nine 1994 students, for example, the scores (66, 60, 45, 45, 41, 41, 39, 36, 27) ranged from 27 (barely above chance) to a high of 66, higher than any score achieved by the Education specialists. The scores for these students clearly fall into two distinct populations. The top two grades are in the 60's, with a mean of 63. The next highest score is 45. The mean for the lower group is 39, which is comparable to the mean for the

Archaeology students. A 24 point difference in the means of the two groups indicates that the second group would have to study English in an intensive program for over three years to reach the level of the higher group.

The top two students in this class are representative of those students who enter the university from one special or enriched language background – years spent living in a native speaking country, attendance at an English medium school etc. Although the total number of such students entering the university is minuscule, the presence of only two or three of them in a class of ten to fifteen students would have an impact far out of proportion to their actual numbers. Teachers who would find it difficult to resist the temptation to address the class to the better students would end up teaching the classes at a level far beyond that for which most of the students in the class would derive benefit. This has been a recurrent problem in the English Department although the magnitude of the gap has not previously been quantified.

A disconcerting pattern in the data for the Arts English Majors is that the scores show virtually no change from one year to the next. If anything, the mean scores decline slightly. Of course these scores are for different groups, and the classes or sample sizes are so small that one or two students may have a significant impact on the mean. Nevertheless, unless subsequent data contradict the above findings, the implication is that the Arts program does not produce a change in CELT scores on a year to year basis. According to the above data, students graduating from the Arts program would not meet the entrance requirements for students in the Education stream.

The difference between the two programs is that the Education students take an intensive language program whereas the Arts students take a program based on literature and linguistics. While one does not question the value of teaching literature for itself, nor does one question the pedagogical value of literature as an aid to language learning, it does appear that, in order for students to derive any linguistic benefit from studying literature, they must reach a threshold level of language proficiency sufficient for them to read the literature on their own. Unless they reach such a level they could apparently remain in a literature program for years without any measurable impact on their language proficiency. A provisional implication of the above scores would be that, in order for a literature program to effective in developing language proficiency, the level of the literature program needs to be integrated with objective measures of the students' language proficiency. If there are two or three students in the class from a different statistical population, the task of

coordinating the level of literature to the student level will become more difficult.

CELT/PET/Grade Correlations

A Pearson correlation study was run between the mean CELT scores and the mean grades for all English courses taken in 1994-95. The product-moment coefficient for this data was .71045, which is within the range defined by Hinkle as "high positive corelation." Given the subjectivity of grading, this figure compares favorably with the correlation coefficients comparing the CELT with the TOEFL and the Michigan Test (.79 and .81 respectively). The coefficient of determination for the above data was .50474. This indicates that, for all English courses taken as a whole, 50.474% of the grades are based on grammar, as measured by this component of the CELT. The statistical significance of the above figures was determined to be 0.0000. Since any figure lower than 0.05 is considered statistically significant, the above figures may be considered highly significant.

A scattergram was plotted, using the mean CELT score as the X-axis and the mean grade as the Y-axis, and a line of regression was determined. The formula was determined to by Y = .05225X – 0.20381; the slope was .05225, and the Y intercept or regression constant was – 0.20831. According to this formula, an increase of 5 points on the CELT score would correspond to an increase of .26 for the mean grade; a change in mean grade from 2.0 to 3.0 was be equivalent to approximately 20 points on the CELT range. The standard error of measurement was determined to be .34128. This means that 68% of the population would be found +/– .34238 from the line of regression; 96% of the population would be found +/–. 68256 from the line of regression.

A Pearson correlation study was run between the mean grades and the PET post-test scores (December, 1994). Since the PET was taken in the middle of the academic year, this test could be considered a concurrent validity test for the PET. The correlation coefficient was .3707. The coefficient of determination was 13.74%. These figures indicate that whatever was measured by the PET contributed 13.74% to the overall student grades. The correlation between PET scores and mean grades can be described as "very low positive correlation". The level of significance for the above figures was .001, which is high significance. In other words, this measure of correlation can be considered reliable.

The CELT is a discrete point test. The PET, on the other hand, attempts to

measure global skills in an integrative fashion. One would assume that certain of these skills would be particularly important for success in English courses which appear to depend on such skills. In order to verify this hypothesis, scores on the skills components of the PET were correlated with grades in apparently related academic courses.

The correlation coefficient between the writing component of the PET and the mean grades in language development courses was .3233, with a significance of .01. The coefficient of determination was 10.45%. This means that whatever was measured by the writing component of the PET contributed 10.45% to the grades in English Department courses in writing. Apparently the PET and the English Department have differing notions regarding what constitutes "writing."

The correlation coefficient between the reading comprehension component of the PET and composite grades in literature courses was .2886. The coefficient of determination was 5.21%, indicated that the skill which was measured by the reading comprehension component of the PET contributed 5.21% toward the average literature grade. One would have thought that ability in reading should have made a greater contribution to success in literature courses. Either something is wrong with this component of the PET, or students are not required to read or are not evaluated by this activity in most literature courses. There may be some truth to both these alternatives. Interestingly, the correlation coefficient between grades in literature courses and the writing component of the PET was slightly higher, at .2886, with a coefficient of determination at 8.33%. Although students should be able to read in a literature course, they are more likely to be evaluated on what they write. However, the level of correlation is still low.

The final test in this series was between the listening comprehension component of the PET and the grades in the phonetics course. This course, which was taught to third semester students, was a practical course in distinguishing and practicing the sounds of English, both individually and within words and sentences. The correlation coefficient for this test was a mere .0899. The coefficient of determination, at 0.81%, suggests that the factors which were measured by the listening comprehension component of the PET contributed less than 1% to the grade in the practical phonetics course. A possible or partial explanation for this discrepancy may be that the accent of the speaker used in the listening component of the PET may have been unfamiliar to many of the testees.

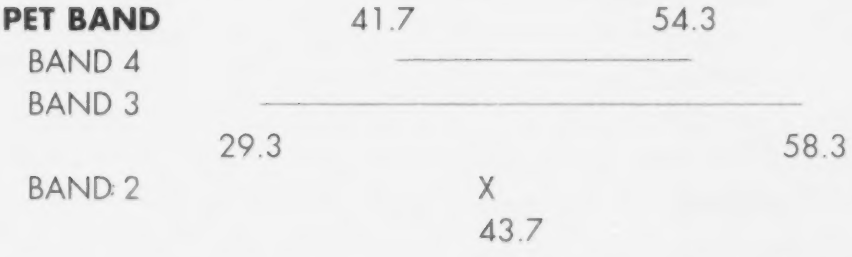
According to the above figures, when the PET is used as a proficiency test, it takes 559 contact hours of instruction for the average student to progress from BAND III to BAND IV. This figure suggests that the difference in ability between BAND III and BAND IV students should be considerable. The next test seeks to determine whether this difference can be measured by either the grades or the CELT scores.

Table #1 above shows that three students obtained BAND IV on the initial PET testing; 17 students achieved BAND IV within the program; 51 students obtained BAND III and 1 student obtained BAND II in the post testing. After over 800 hours of instruction, the students who initially obtained BAND IV would probably be in BAND V or above, which PET does not measure. The following test refers, therefore, only to students who obtained BAND IV within the program. For the seven students who reached BAND IV from BAND II, the mean CELT score was 47.6; the mean grade was 2.28. For the two students who reached BAND IV from BAND I, the mean CELT score was 47.15; the mean grade was 2.36. However, for the entire population, the mean CELT score was 47.1 while the mean grade was 2.23. According to the mean figures, students who reached BAND IV within the program are indistinguishable from the rest of the population.

The range of grades and CELT scores tells much the same story. The range of scores may be represented graphically. In figure #1, the PET BANDS are shown with the corresponding CELT scores. In figure #2, the PET BANDS are shown with the corresponding grades.

Figure 1

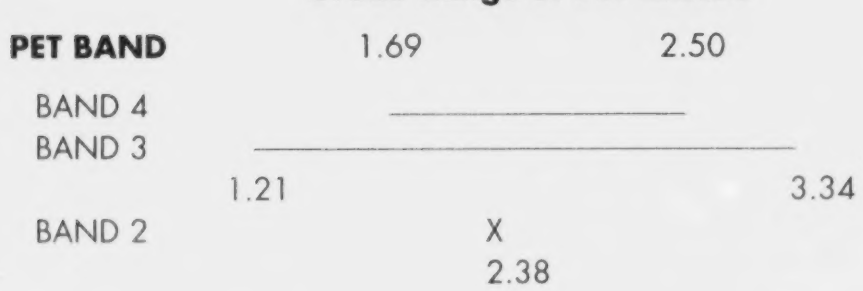
CELT Range of Pet Bands



The entire range of CELT scores for students who had achieved BAND IV fits within the range of CELT scores for students who had achieved BAND III. Curiously, the student who obtained BAND II received a CELT score within the range of CELT scores for BAND IV students.

Figure 2

Grade Range of PET BANDS



As with the CELT scores, the entire range of grades for students who had achieved BAND IV within the program fits within the range of grades for students who achieved BAND III. The student who achieved BAND II did proportionately better in grades than he did in the CELT score, near the top of the BAND IV range. Unless it can be demonstrated that the PET measures some aspect of language not measured by either the CELT test or the grades, the figures for the means and the score ranges suggest that it was largely a matter of chance whether a student obtained BAND III or BAND IV on the second sitting of the PET test. This conclusion applies to the situation in which the PET was used as a proficiency test, not as an achievement test, for which different criteria may apply.

Analysis of subject and course

Pearson correlations were run comparing CELT scores and grades on a subject by subject basis and on a course by course basis. The highest correlation (.73325) was between CELT scores and grades in all skills courses combined. Since a total of fifteen different teachers taught these skills courses, variations in the grading patterns of individual teachers were largely subsumed in this figure. For literature courses, the correlation was .48222; for linguistics, .46044. The lowest correlation was between the CELT scores and the grades in the phonetics courses, at .3440.

Pearson correlations were then run between the CELT scores and the grades on a course by course (semester by semester) basis. In several cases, there were noteworthy difference between correlations in the same type of course from one semester to the next. For example, the correlation between CELT scores and literature grades in the fall semester was .45924; for the spring semester, the correlation dropped to .31707. The coefficient of determination for this figure would be 10.05%.

In cases where such discrepancies appeared, Pearson correlations were run between the grades in the first semester and grades in the second semester of the same subject. This test indicated that, whatever factors were responsible for the grades in the first semester of literature, they contributed only 11.91% to the grades in the second semester of literature.

Pearson correlations were then run between the grades in the grammar course and the grades in the two literature courses. The coefficient of determination between the grammar course and literature I was 40.16%; the coefficient of determination between the grammar course and literature II was 2.64%. Quite clearly, the proportion of the grade based on grammar in literature I was around 40%; for literature II, the proportion of the grade based on grammar dropped to less than 10%.

The mean grade for literature I was 1.90; for literature II, 1.95. If one just considered the mean grades, it would appear that equivalent grading standards applied for these two courses. However the Pearson correlation studies clearly show that the grades in literature I were based on quite different criteria from the grades in literature II. Its reasonable to assume that such differences could be accounted for by the grading habits of individual teachers. In the first semester, five different teachers taught literature; in the second semester only two different teachers taught this subject. Hence the mean grades in the second semester were not teacher independent.

Analysis of Teacher

In order to identify systematic patterns in the grading habits of individual teachers, several tests were run. The first was a CELT/GRADE line of regression for each individual teacher. Based on the line of regression, it would be possible to predict the grade a student would obtain from each individual teacher, based on that student's CELT score. The most probable grade would lie directly on the regression line. The accuracy of the prediction is determined by the standard error of measurement. In the formula for the line of regression ($Y = AX + B$) the slope (A) indicates the degree of differentiation of grades. A high slope would indicate substantial discrimination in grades; a low slope with indicate inadequate discrimination in grades. The Y Intercept (B) indicates the grade a student would receive if he scored 0 on the CELT. Since the test is a multiple choice test, a student could obtain 18 by chance. Hence, if B were positive, this would indicate inadequate identification of the weakest students.

Regression formulae for all fifteen teachers are shown in Appendix #2.

Included are estimated grades for various CELT scores. The slopes vary from .09382 to .02723. In the case of the teacher with the highest slope, the range of grades for a 40 point CELT spread would be 3.76; In the case of the teacher with the lowest slope, the range of grades for a 40 point CELT spread would be 1.08. In the latter case, all students would be virtually certain to receive the same grade. Seven of the fifteen teachers show a positive Y intercept, indicating that the weakest students have not been properly identified. No student tested has obtained a CELT score as low as 30. Yet if a student were to receive such a score, teacher # 6 would give that student a C grade.

The next test was Pearson correlation between CELT scores and the grades of each individual teacher. For most courses, this figure could serve as a measure of the teacher's objectivity or at least the percentage of the grade based on grammar. The results are shown in Appendix # 3. The coefficient of correlation varies from 42.572% to 5.420%.

The next test was a Pearson correlation between the grades for each teacher and the mean grades for all other classes. This indicates the extent to which that teacher's opinion of a student coincides with the opinions of most other teachers. In other words, the grades are based on similar factors. The results are also shown in Appendix # 3. The coefficients of determination varied from a high of 78.408% to a low of 26.345%. The correlation figures with other teachers are approximately double the correlation figures for the CELT. For most teachers, grades would be determined by grammar plus other factors. If one subtracts the CELT correlation from the grade correlation, one could obtain a figure indicating the extent of agreement with other teachers based on factors other than grammar (or language proficiency).

With the aid of these various tests, it would be possible to develop a comprehensive teacher profile including means, standard deviations, weight given to language proficiency, extent of grade discrimination, agreement with other teachers and other factors.

Analysis of Student

Several tests were run to determine student contribution to grading. The first of these was a Pearson correlation between mean student grade and standard deviation in grades. The standard deviations for student grades ranged from a high of .973 to a low of .177. A low standard deviation means most teachers agree on the level of the student; a high standard deviation shows lack of agreement. The purpose of the test was to determine if teacher consensus was

related to the ability of the student. Is there agreement among the teachers regarding which students are the best or the worst? The study showed virtually no correlation between grade level and standard deviation. Teachers appear to have the same level of difficulty agreeing on the best and worst students as on the students in the middle of the range.

The next study was Pearson correlation between standard deviation in grades and standard deviation in CELT scores. A high standard deviation in grades could indicate either erratic student performance or variations in the way the student is perceived by the various teachers. The standard deviation in CELT scores (whether the student improved or not) may provide an objective if limited example of actual variation in student performance. The study showed no correlation between these items. In fact the correlation was slightly negative, –.01835. The statistical significance of the test was very low, at .8733. Although such a negative result is inconclusive at best, it does suggest that the most promising explanation for a high standard deviation in grades may lie with teacher perception rather than student performance.

The next study was a Pearson correlation between improvement in CELT scores (in absolute terms) and mean CELT scores. The purpose of this study was to determine whether the better or the weaker students showed the greatest improvement in language proficiency. One would wish to determine whether the better students continue to accelerate so that the gap between the strong and weak students widens or whether the good students reach some plateau where they become complacent and allow the weaker students to catch up with them.

The variation in improvement in CELT scores during the course of the year was substantial. The greatest improvement during the year was 22 points; the second highest was 20 points. On the other hand, 10 students (12.7% of the population) showed a decline in CELT score throughout the year. Another 8 students showed an improvement of less than 2 points (within the standard error of measurement of the test). Although the overall improvement of the entire population on a group by group basis was reasonable and statistically significant, up to 20% of the students showed no measurable improvement. This figure was higher for certain groups. Although teachers may be gratified that the proficiency tests show statistically significant improvement over the year, it is disconcerting to determine that between one fifth and one quarter of the population apparently did not improve during the year. The Pearson correlation between improvement in CELT scores and mean CELT scores was a low but

positive .2873. This figure indicates that, in general, the better students improve at a slighter higher rate than do the weaker students.

The final test was a Pearson correlation between improvement in CELT scores and mean grades. The purpose of this test was to determine the extent to which improvement in language proficiency was identified and rewarded by the grading system, (N.B. In a more refined version of this test one could compare the difference in mean grade between semester 1 and semester 2 with the improvement in CELT scores only from the second semester.) If the grading system does not identify and reward improvement in language proficiency, then the incentive to improve will tend to be curtailed. The correlation for this test was a very low but positive .3244. The index of determination was 10.52%, indicating that, on average, 10% of a student's grade would be based on improvement in language proficiency. On the other hand, with the BANDING system used by the Language Centre, up to 100% of a student grade may be based on improvement.

What mechanism could account for the relatively low weight which improvement appears to have in the grading in the English Department? If an average student attempts to incorporate recently learned structures into his/her work, the student may make more mistakes and hence become more vulnerable that a student who "plays it safe" or avoids risk by limiting the use of structures to those with which he/she is already fully conversant. A grading system based exclusively on an error count in a global or integrative activity may promote or enhance fossilization in the development of language skills. If a deliberate decision is taken to increase the weight of improvement in the grading system, mechanisms which encourage such fossilization should be identified.

Conclusions

1. Upon entry to the university, the average student is around IELTS BAND 2.3. Some redial program is required for students requiring English for University study.
2. Students who achieved (PET Proficiency) BAND 4 after three semesters within the program were indistinguishable from the rest of the population in grades or CELT scores.
3. When the PET is used as a proficiency test, it takes students around three times as long to reach BAND 4 than when PET is used as an achievement test based on some curriculum designed to lead into the test. A distinction must be made between Proficiency BAND and Achievement BAND 4.

4. Pearson correlation between PET exit scores and overall mean grades was low, at .3707. Pearson correlations between the skills components of the PET and the grades in courses apparently requiring such skills ranged from very low to no correlation whatever.

5. Within the English Department, improvement in language proficiency (as measured by the CELT) varies significantly on a group by group basis depending on the type of program. Another measure of the success of different programs could be the statistical significance of changes in standard deviation.

6. In a one semester program of 18 contact hours per week, according to the CELT, students progress at about the same rate, whether they are in the Language Centre or the English Department.

7. English Arts Majors are considerably more heterogeneous than Education English Specialists. The average CELT score for graduating English Arts Majors is slightly below the entry level for Education English Specialists. There appears to be no improvement in CELT scores during the three years of the (primarily literature and linguistics) program for Arts Majors.

8. The level of English for Archaeology students, at around IELTS BAND 2, is inadequate.

9. The correlation between CELT and overall mean grades was high, at .71045. The highest subject correlation was between CELT and overall Language Skills courses, at .73325. The lowest subject correlation with CELT was with Phonetics, at .3440.

10. Correlation between CELT and different semesters of the same subject sometimes varied considerably. For literature I (5 teachers), 40% of the grade was based on language proficiency; for literature II (2 teachers), less than 10% of the grade was based on language proficiency. Evidently, substantially different criteria applied in determining the grades for the two semesters of the same subject.

11. Profiles for each teacher were determined, including means, standard deviations, correlations with CELT, correlations with other teachers' grades, and lines of regression. Such profiles seek to determine objectivity, grade range, discrimination at higher and lower levels, agreement with other teachers' opinions, and spread of grades. Such information should enable one to distinguish the teacher factor from the subject factor in analyzing grading profiles.

12. Four studies were conducted to determine student contribution to grading profiles. The first was to determine whether teacher consensus was related to quality of student. The second was to determine whether variation in teacher perception was related to variation in student performance. The third was to determine whether improvement in language proficiency was related to level of language proficiency. The fourth was to determine the extent to which the grading system identified and rewarded improvement in language proficiency. Correlations for these four tests varied from low positive to slightly negative.

Appendix 1: CELT Results

CELT Pre-Test, Mid-Test, Post-Test

1993 English Education Specialists

Group	CELT 1 MEAN	CELT 2 MEAN	C2-C1 DIFF	CELT 3 MEAN	C3-C2 DIFF	C3-C1 DIFF
A	46.22	52.56	6.33	56.50	3.94	10.28
SD/P	8.26	7.22	.000	6.67	.006	.000
B	44.53	48.31	4.20	50.38	2.08	5.77
SD/P	5.94	6.06	.022	7.49	.166	.023
C	41.56	44.81	3.25	46.69	1.88	5.13
SD/P	5.82	6.77	.018	6.92	.168	.003
D	40.53	46.14	4.73	49.07	2.93	8.07
SD/P	5.49	7.09	.000	7.17	0.19	.000
E	41.20	43.91	1.80	48.36	4.45	5.36
SD/P	6.15	5.47	.270	4.86	.002	.010
Total	42.92	47.06	4.14	50.53	3.47	7.14
SD/P	6.72	7.46	.000	7.52	.000	.000

CELT Results for September 1995 Testing of 1994 English Education Specialists

	Group A	Group B	Group C	Group D	Group E	Total
Mean	48.33	48.55	50.11	43.92	44.58	47.10
SD	6.579	9.325	7.830	5.361	7.177	7.254
Range	27	33	32	19	22	37
Min	32	27	32	34	35	27
Max	59	60	64	53	57	64

CELT Results for Arts English Majors

Year of Entry	1994	1993	1992
Mean Score	44.44	42.21	41.50
# Students	9	14	12
Standard Dev.	11.92	9.89	8.73
Range	66-27	60-29	54-31

Appendix 2 (Teacher Regression Formulae)

T	Formula	30	40	MEAN	50	60	70
01	Y = .06270 X - 0.92705	0.95	1.59	1.97	2.22	2.84	3.46
02	Y = .04485 X - 0.42809	1.77	2.22	2.65	2.67	3.12	3.56
03	Y = .05155 X - 0.29727	1.25	1.76	2.07	2.28	2.80	3.31
04	Y = .05697 X - 0.65119	1.06	1.63	1.93	2.20	2.77	3.34
05	Y = .06145 X - 1.03933	0.80	1.42	1.81	2.03	2.65	3.26
06	Y = .04929 X + 0.67186	2.15	2.64	2.82	3.14	3.63	4.12
07	Y = .02723 X + 0.95173	1.77	2.04	2.19	2.31	2.59	2.86
08	Y = 0.3360 X + 0.71509	1.72	2.06	2.16	2.39	2.73	3.07
09	Y = .02688 X + 0.72769	1.54	1.81	2.04	2.08	2.35	2.62
10	Y = .05728 X - 0.03470	1.68	2.26	2.85	2.83	3.40	3.98
11	Y = .06269 X - 0.52040	1.36	1.99	2.39	2.61	3.24	3.87
12	Y = .04102 X + 0.24738	1.48	1.89	2.05	2.30	2.71	3.12
13	Y = .03647 X + 0.51985	1.62	1.99	2.12	2.34	2.71	3.07
14	Y = .05960 X - 0.23087	1.48	2.15	2.40	2.75	3.34	3.94
15	Y = .09382 X - 2.36378	0.45	1.39	2.09	2.33	3.26	4.21
MN	Y = .05225 X - 0.20381	1.36	1.89	2.25	2.41	2.93	3.45

Appendix 3

CELT and Grade Correlations Teacher by Teacher

Teacher	# Courses	CELT Corr	CELT r^2	SIG	Grade Cor	Grade r^2	SIG
01	4	.53661	.28795	.0000	.77583	.60191	.0000
02	2	.44182	.19521	.0114	.71053	.50486	.0000
03	2	.37852	.14327	.0358	.75008	.56263	.0000
04	2	.64143	.41143	.0002	.73186	.53561	.0000
05	2	.65247	.42572	.0001	.72065	.51934	.0000
06	1	.55836	.31177	.0380	.53217	.28320	.0501
07	5	.23282	.05420	.0389	.54940	.30184	.0000
08	1	.45640	.20830	.0873	.72375	.52381	.0023
09	5	.34603	.11973	.0021	.63390	.40183	.0000
10	3	.53879	.29129	.0000	.68260	.46594	.0000
11	4	.58453	.34168	.0000	.68900	.47471	.0000
12	2	.44142	.19485	.0146	.51327	.26345	.0037
13	1	.40456	.16367	.1347	.79220	.67758	.0004
14	4	.49386	.24389	.0001	.77672	.60330	.0000
15	2	.60615	.36741	.0004	.88548	.78408	.0000

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PART VI

Concurrent Session Papers

TOPIC # 2: THE SIGNIFICANCE OF PRACTICUM IN STUDENT-TEACHER'S CURRICULUM AT THE TEACHERS' COLLEGES OF EDUCATION IN OMAN.

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ABSTRACT

The main purpose of this paper is to highlight the practicum program, its objectives, and its significance in student-teacher's curriculum at the Teachers' Colleges of Education in Oman.

The presentation of this paper will include a display of the teaching observation form, and how the student-teacher is evaluated accordingly. This observation form contains certain criteria needed to measure student-teacher's performance as far as teaching is concerned.

Finally, a set of recommendations will be listed at the end of this paper.

KEY NOTES

Abbreviations will be used in this paper instead of certain words, and may be pronouns. The abbreviations will be used as follow: *I* instead of *We*, *He* instead of *He/She* or *Male* and *Female*, *His* instead of *His/Her*, *Him* instead of *Him/Her*, and *My* instead of *our*. I will use *PP.*: for indicated Pages, and *P.*: for an indicated page.

INTRODUCTION

The need to evaluate the abilities of student teachers is beyond question. The way in which student teachers are evaluated is the subject of many questions. What should be the purpose of evaluation used with student teachers?.

Educational evaluation can be formative or summative in nature. According to Lewis, formative evaluation is "essentially a process used to gather information about the individual's strengths and weaknesses for the purpose of helping the individual to improve" (Lewis, 1982, cited in Roberston, 1986). Robertson says that "summative evaluation is the process used in making judgments concerning a person's effectiveness" (P.7). In this form of evaluation, assessment is made concerning performance compared to a standard, usually pre-set, in order to make administrative decisions, such as promotion, retention, and continuation. (Lewis, 1982, cited in Robertson, 1986).

The summative evaluation form in use by the Teachers' Colleges of Education in Oman consists of multiple criteria in which the student teacher is evaluated by use of a category rating system. In addition, the evaluator is provided spaces to enter supporting or explanatory comments. (A copy of this form is found in the appendix #1). The summative evaluation of student teachers allows decision makers (college and school supervisors) to make judgments about student teachers' qualifications for teacher certification.

Teachers colleges are built to offer student teachers the Bachelor of Education (BED), in order to have Omani teachers who are well qualified for teaching, specially in high school levels. Dawson P. stated the following: "It is now almost impossible to enter the teaching profession without a degree of some kind. The development of the Bachelor of Education (BED) degree in the teacher training institutions, to replace the old certificate in education, has provided the basis for this" (P.34).

Training teachers has developed gradually in Oman. Teachers used to qualify with three years diploma after middle school level, and/or two year diploma after high school level. Since then, all teachers who graduated without bachelors were put in In-service courses to update their knowledge, and validate their qualifications to teach in middle school levels. As Dawson P. said: "It is now almost impossible to become a teacher without taking a recognized course of professional training" (P.35).

The discussion of the paper will be based on two colleges. Teachers' College of Education in Sohar (male), and Teachers' College of Education in Rustaq (female).

PRACTICUM PROGRAM COMPONENTS:

A- THE COLLEGE-BASED PRACTICUM

The College-Based Practicum Program consists of two sub-components, Microteaching, and Workshops. It involves student teachers from second through fourth year having to master several skills through Microteaching, and workshops (see table #1, P.12). They get the basic foundation of teaching through the two sub-components (See appendix #3). The College-Based Practicum Program occupies a certain portion of the total period of time that is given to the Practicum Program of the semesters. It provides student teachers experiences of the following skills: lesson planning, school curriculum, teaching strategies, use of visual aids, education technology, linguistic skills, assessment, and classroom management. (See Program Committee, 1995).

As it is mentioned in table #1, both Microteaching and Workshops have separate credit hours to be taken during each semester. The activities that the student teachers should take in each sub-components of the College-Based practicum are clearly identified.

The student teachers are mostly working independently and/or cooperatively in Microteaching activities, as well as cooperative grouping in the Workshops. The instruction of the activities in both sub-components are related to teaching skills, but the Workshops present, analyze, and discuss more than one item of teaching skills in each session, while Microteaching presents a specific item separately. The student teachers are able to master the main teaching skills through the study of the professional constituent or through the College-Based Program (Microteaching). Moreover, they are trained in the implementation of teaching skills. Two hours of microteaching are scheduled for students each week, so that they get sufficient training in teaching skills, then students will be capable to practice these skills in real life classroom situations. Hoyle E. discussed the following: "In the classroom the teacher acts in accordance with his own image of how a teacher should act. These self-images are dependent partly upon the teacher's personality and partly upon his experience as a pupil, student of education and as a beginning teacher" (P.65).

B- THE SERIAL PRACTICUM

The Serial Practicum Program is divided into two divisions (sub-components); Administrative Internship, and field training of Teaching. In the third semester, second year students start visiting schools after they have had

adequate practice through college-based practicum. In other words students' involvement in microteaching and workshops in the college have prepared them for the school atmosphere. As Hoyle E. pointed out: "The teacher will have become aware of some of the expectations of the role whilst he himself was at school" (P.37). Nevertheless, visiting schools in the third semester does not mean taking part in teaching but observing lessons as the first step, and getting to know the school system and its administrative and academic faculty members. (See the Administrative Intern, table #1, P.12).

Students are divided into groups. Each group includes not more than ten students in one school for every special subject field. A supervisor is nominated to assess and evaluate each group and report on their work. Each of the trainees must have a folder with his name, major, and group number. A record of marks should be kept with the person in charge of practicum and the supervisor. Reports should be given back to trainees after they are marked by the supervisor. Seven visits out of fifteen weeks of the semester are provided for the serial practicum while the remaining weeks are provided for college-based practicum, that is microteaching and workshops.

In the fourth semester (second year) students start practice teaching in the cooperating schools since they have benefited from the previous semester (third semester) through observing some classroom lessons beside the administrative work. At this point, the supervisor uses the observation form to assess trainees' performance according to the listed criteria by the use of category rating system (see appendix #1, P.17). This observation form is used from semester four through semester eight. The evaluation used here can be either summative or formative. Formative provides directional feedback, while summative provides summary information to be used by decision makers.

Both types of evaluation are essential to trainees since they provide feedback after they finish teaching their lesson. This feedback is obtained from both the supervisor and the trainee himself. They can discuss the strengths and weaknesses of student' performance (formative). This helps the trainee to improve his performance in future. To contrast the two, one trainee could perform better than the others, and so the trainee's competence and performance is compared to other trainees i.e. (summative). The supervisor should bare in mind the individual differences among trainees and therefore, they should be taken into account as far as the evaluation is concerned.

C- THE BLOCK PRACTICUM

There is a difference in the length of time for Block Practicum Program from one semester to another. For example, the third semester has no portion for the Block Practicum Program, while there are thirty hours in the fourth, and the fifth semesters respectively. The sixth and the seventh semesters take sixty hours each, and ninety hours for the eighth semester. (See table #1, P.12).

Student teachers practice the actual teaching and other administrative issues either related to classroom management or school administration. Block Practicum Program is planned to provide student teachers with a comprehensive teaching experience. Block practicum covers second year (fourth semester), and third and fourth year student teachers. (See Block Practicum, table #1, P.12). Trainees are expected to work full time during the block practicum. In other words they should be fully involved in all school activities.

Many staff members are involved in evaluating trainees in block practicum using the same observation form. Saphier J. & Gower R. mentioned the following: "Students may be directly supervised by a teacher who checks on what and how everybody is doing, may be independent and responsible for their own work, or the teacher may facilitate their work by which we mean being available as a resource person and occasionally intervening with suggestions, recommendations, or stimulating questions" (P.59).

A supervisor must accompany the trainees when it comes to field training. He is a resource with wide knowledge and experience and so can act as a guide and tutor. Someone being available increases self confidence in student teachers, which leads to a high level of performance.

In Block Practicum student teachers are advised to exchange classroom visits with their colleagues, and other cooperative teachers. This is useful in terms of getting new experiences because each one has his own way of teaching, different methods and styles. Consequently, this is beneficial some way; they can reflect on each other's work. This means having a positive attitude towards developing and improving oneself which we call the agent of change.

DISPLAY OF OBSERVATION FORM CRITERIA

Criteria have been defined as standards that are used by evaluators to make judgments about the level of performance of student teacher. According to Duke and Stiggins, "performance criteria define the dimensions of teacher performance to be evaluated. Performance standards represent required levels

of performance with respect to the criteria" (P.27). Under all circumstances it is essential that those criteria and standards be given careful consideration prior to any evaluation. They add that criteria must focus on important aspects of the teaching-learning process, be objectively observable, and be clearly communicated to the teacher.

Criterion referenced evaluation instruments are used to judge the student teacher's performance against skills that are assumed to affect student learning. For the evaluators to make proper judgments, it is necessary to develop clearly defined indicators. A method must be provided for tracking student teacher's performance. Finally, criteria must be set whereby the student teacher's performance may be judged adequate or inadequate.

When specific teaching skills and precise performance indicators are available, the usability of the instrument by the differing evaluators (college supervisors, and school principals) will be increased in meaning, consistency and reliability.

The criterion-referenced evaluation format serves four functions: firstly; it provides a precise body of skills and abilities that the student teacher and his supervisors can work with to facilitate the teaching art; secondly, it provides for clearly-defined skills which the student teacher is expected to exhibit; thirdly, it provides criteria against which the student's performance can be judged; and fourthly, an evaluation of the student teacher abilities, independent of the performance of others, is possible.

The criteria displayed in appendix #1 shows that the student teacher is prepared for teaching through three main components. The first component (Planning for Teaching) stresses pre-learning since it reflects the student teacher readiness as far as the lesson is concerned. The second component (Lesson Implementation) emphasizes the process during learning in terms of using the right instructional materials and learners' interaction through the tasks involved within the lesson. The third component (Evaluation) deals with after leaning skill which shows that students have achieved what they have already learned.

PRACTICUM OBJECTIVES AND ITS SIGNIFICANCE

The practicum objectives are spread all over the main components; the College-Based, the Serial, and the Block Practicum Program, therefore, the student teachers may gain experiences through the three main components of the Practicum Program. The Administrative Internship sub-component of the Serial Practicum Program is planned only for the second year college students

(third semester), whereas the College-Based, Serial, and Block Practicum Program are planned to serve the rest of the sub-components of the second, the third, and the fourth year students.

The philosophy of the teachers' colleges of education in the Sultanate of Oman is to prepare and produce qualified teachers at the end of the college course. So, practicum is to start in the third semester (second year through the eighth semester of the fourth year). The concept of the Practicum Program is presented in both academic and professional aspects in an integrative way. This concept is of vital importance since it gives student teachers the chance to develop competencies, self-awareness and responsibilities through the actual participation in practicum. However, before this, student teachers are trained inside the college (College-Based Practicum). College-Based Practicum includes microteaching, and workshop seminars. It is believed that this training helps them to be psychologically ready to encounter the new environment (school), as well as reducing the anxiety that the student teachers may feel at the first time of teaching. In addition, student teachers should be adequately trained so that they can make themselves responsible trainees. For example, Program Committee stated the following: *"The teaching profession requires that a teacher should acquire a number of basic skills related to indoor and outdoor school activities, get acquainted with the surrounding environment and know how to interact with its resources and make use of the simple available tools" (P.18)*. I would say that the teaching profession requires that the student teacher be trained as well as be evaluated on creative visioning, whether the student teacher is capable to present creative ideas related to school activities or not.

Student teachers should be aware of the importance of the practicum program. Program Committee stated the following: *"According to the philosophy on which the program of teacher preparation is based, the Practicum starts from an early stage of the program; it starts in semester three (second year) and is given about 20% of the total credit hours of the program (132)"* (P.3).

The student teacher is encouraged to finish all practicum credits on time, and these credits are compulsory, so that he is obliged to complete the stated credits in each semester, otherwise, he may delay his graduation day. Table #1 shows that each component and/or sub-components of the practicum has limited credits, and these credits should be taken gradually according to its bases, because first and second semesters are interrelated. The Program Committee found out: *"Each of these components is allocated a portion of the*

whole time given over to the Practicum. The determination of time depends on the time required for completion of the component and its relative importance" (P.2). Clearly, the distribution of the credits are almost the same in each component between the third and the sixth semesters, which may show that this is a concrete period for building up student teachers' knowledge, and they should gain new experiences through these semesters. The gained experiences through the seventh and eighth semesters, indicate intensive credits that student teachers need to deal with the components, especially for block practicum. (See table #1, P.12).

TABLE # 1

ACADEMIC LEVELS		**2ND YEAR**		**3RD YEAR**		**4TH YEAR**	
SEMESTERS ⇨		**3**	**4**	**5**	**6**	**7**	**8**
COMPONENTS ⇩	**SUB-COMPONENTS ⇩**						
College-Based Practicum Program	Workshops	62 Hours	28 Hours	28 Hours	26 Hours	26 Hours	24 Hours
	Microteaching		20 Hours	20 Hours	20 Hours	20 Hours	12 Hours
Serial Practicum Program	Administrative Internship	28 Hours					
	Teaching		40 Hours	40 Hours	40 Hours	40 Hours	24 Hours
Block Practicum Program	Teaching		30 Hours	30 Hours	60 Hours	60 Hours	90 Hours
Total of Credits	**90**	**118**	**118**	**146**	**146**	**150**	

CREDIT AND COMPONENT DISTRIBUTION OF THE PRACTICUM PROGRAM

(The information in table #1 is organized to reflect simple understanding related to the Practicum courses. (See Program Committee, 1995).

The total credits hours of practicum are increased gradually each semester (see table #1). The Program Committee mentioned that the Practicum Program *"...starting from the third semester and ending in the eighth one with a gradual increase reflecting an increasing involvement of the student teacher in the Practicum activities on one hand and in conformity with the preparation of student teacher in the professional component, on the other"* (P.3).

SUGGESTIONS

I suggest giving student teachers more trust in sharing experiences with colleagues. They can coteach, cooperate, and prepare visual aids related to various grades. Student teachers should be encouraged to prepare lesson plans with counter parts. I agree with what is mentioned by Sparks D. and Hirsh S. *"In addition, teachers are more often planning lessons with colleagues or as part of teaching teams. Teachers may plan lessons together, coteach the lesson, and analyze its effectiveness"* (P.64).

According to my previous experience as high school principal, I would suggest the following tables, which may help to run practicum duties successfully. Each table can be used as indicated and/or may be used for multiple purposes.

Table #2 can be used for running the Administrative nternship sub-component, Serial Practicum, for the third semester, second year students. It helps the supervisors to follow the targeted goals for each visit. It can be used for organizing the duties of the administrative internship (third semester, see table #1, P.12). It indicates that each goal has specific items that are needed to be accomplished by student teachers. It can be used as a guidance for the supervisor and student teachers to follow. This table helps them to identify visits, indicate dates, goals, items needed to be accomplished according to the visit. Also, it shows the limited time which should be spent on each item during the school day, and recording comments after each visit if necessary.

Table #2

VISIT	DATE	TARGETED GOALS	ITEMS TO BE ACCOMPLISHED	TIME	COMMENTS
	/ /199			:	
				:	
				:	
	/ /199			:	
				:	
				:	

ADMINISTRATIVE INTERNSHIP GUIDANCE FORM

Table #3 is used for all Practicum Program components. It shows a distribution of classroom visits, that can be for different purposes, such as classroom observation, and teaching practice. It helps the supervisor to

organize his work related to student teachers' duties. It is usable for all field subjects. It shows student teachers' names and their duties according to each visit, indicated dates for each visit, and the cooperating school and its location.

Table #3

Cooperative School: ( ) Location: ( )

DATE OF THE VISIT ⇨ / /			199 / / 199													
NO.	STUDENT ⇩	PERIODS⇨	1	2	3	4	5	6	7	1	2	3	4	5	6	7

DISTRIBUTION OF CLASSROOM DUTIES FORM

Table #4 is organized to control student teachers' periods of teaching practice. This table is used by the supervisor only, in order to control teaching practice distribution among the student teachers. It also shows student teachers' names, indicated dates and lesson purposes according to each period of teaching practice.

Table #4

Cooperative School: ( ) Location: ( )

NO.	STUDENTS	TEACHING PRACTICE # ( )				
		DATE	THE PURPOSE OF THE LESSON	CLASS	GRADE	PERIOD
		/ /199				
		/ /199				

TEACHING PRACTICE DISTRIBUTION FORM

RECOMMENDATIONS

Since Practicum Program is important in teacher education, both educators and academic staff members feel that there should be ways to improve it. This will not only help the student teacher but all people who are involved in practicum. The school principal, the cooperative teacher, and the supervisor can all contribute positively to the success of the program. Practicum is a significant part of the curriculum at the teacher college of education. And therefore, it has to be developed and improved through some points below:

- Increase the number of staff for practicum supervision
- Decrease the number of students at cooperative schools

- The emphasis on cooperation between the colleges and cooperating schools
- Exchange visits between colleges so that students gain experience
- Condense the workshops and microteaching in the colleges in which students will be able to acquire suitable methods and techniques before entering the actual classroom.
- More instructional materials and visual aids should be made available to all students in order to consolidate the subject matter.
- To establish Practicum Program Guidance.
- To share responsibilities between colleges and cooperating schools concerning supervision.
- A certain percentage of marks from the principal to be used in evaluating student teacher.
- Provide a register book for student teachers attendance at cooperative schools.

CONCLUSION

This paper has focused on Practicum Program; College-Based, Serial, and Block Practicum, and its significance in student teachers' performance at the field of teaching. It is obvious that Practicum is of value since it occupies 20% of the entire college curriculum. The Practicum Program takes six continuous semesters throughout the college course. Fifteen weeks for each semester means that practicum cannot be accomplished in one semester. The Practicum Program provides students with basic teaching skills through workshops and microteaching before entering the real classroom situation. The Ministry of Education and the colleges work collaboratively to overcome any dilemma that may appear concerning practicum, and so there is a communication network between them. In other words, there is a representative from the General Directorate of Education involved in Practicum Committee at Colleges. This is to help with the provision of schools and coordination with schools' principals, because the role of principals is of value in achieving the Practicum's goals and objectives. This role also determines the success or failure of Practicum.

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APPENDIX #1

STUDENT TEACHER'S OBSERVATION FORM
SERIAL & BLOCK PRACTICUM PROGRAM

Student's Name: Date: / /1997

Cooperative School: Class: Grade: Period:

Lesson Purpose: ( )

No.	ITEMS	SCALES					COMMENTS
	First Component: Planing For Teaching	1	2	3	4	5	
1.	Behavioral goals formation						
2.	Determination of pre-learning achievement						
3.	Planning activities for goals achievement						
4.	Planning for goal achievement evaluation						
	Second Component: Lesson Implementation						
1.	Lesson preparation						
2.	Learners' motivation						
3.	Learning techniques						
4.	Collaborative work						
5.	Reinforcement						
6.	The use of instructional materials						
7.	Classroom discussion						
8.	Good use of Arabic Language						
9.	Discipline and classroom management						
10.	The use of textbook						
11.	Subject matter						
12.	Elicitation						
13.	Time factor						
14.	Student background environment						
	Third Component: Evaluation						
1.	Variety of evaluation techniques						
2.	The effectiveness of assessment						

Supervisor's Name: ( )

(The information of appendix #1 is adopted as it is used in Rustaq college.)

APPENDIX #2

ASSIGNMENTS FOR SEVEN VISITS
SERIAL PRACTICUM - ADMINISTRATIVE INTERNSHIP

Trainees should learn about:

VISIT	ITEMS SHOULD BE ACCOMPLISHED	
FIRST	Draw a map plan of the school	Administrative structure of the school
	Number of classrooms	Number of students
	Appearance of school (Hygiene)	
SECOND	Principal's role	
THIRD	Admission at preparatory and secondary levels	Student transfers
	School system and student discipline	School activities
	Punishment	
FOURTH	Students' record	School hygiene
	Inspection visits record	In/out records
	Meeting records, and school board record	Student folders
	Attendance record of teachers and students	Worker folders
FIFTH	The role of the School Board Council	Taking part of participation in the administrative control of school.
SIXTH	The role of the Parent Teacher Association	Educational importance of the Board Councils in decision making
SEVENTH	Learning Resource Center	Cooperative schools and other enterprises

(The information of appendix #1 is adopted as it is used in Sohar and Rustaq colleges.)

APPENDIX #3

COLLEGE-BASED PRACTICUM

WORKSHOPS:

Workshops are divided into groups of four to five. Each group is assigned to study a certain content lesson. Each student's assignment is to teach part of this content lesson then the rest of the groups discuss it with other groups. The supervisor has to check on linguistic skills when evaluating students.

⇩

Students are assigned to prepare a daily plan in groups and individuals. These plans are then displayed for discussion. The supervisor and students comment on the plans to get feedback.

⇩

MICROTEACHING:

Students are assigned to prepare a lesson plan through microteaching. They then get feedback from both the supervisor and the students themselves based on skills as mentioned in the evaluation card.

⇩

FIELD EXPERIENCE (SERIAL AND BLOCK PRACTICUM)

The student's assignment is to prepare daily lesson plans and submit them to the supervisor for feedback. The lesson plans can be for serial and block practicum.

(The information of appendix #1 is adopted as it is used in Rustaq college.)

EDUCATIONAL TECHNOLOGY AND CONTINUING TEACHER EDUCATION

by

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Educational technology and continuing teacher education: challenges and possibilities

*Rute Baquero**

This paper attempts to investigate the use of educational technology in continuing teachers education programs. In order to achieve this goal, the paper presents, first of all, different teachers' continuing education models that have deeply influenced the Brazilian educational setting over the last decades in relation to the desired teachers qualification process as well as its purpose.

Secondly, it discusses technological concepts and practices present in the former process, viewing them in terms of possibilities and challenges for a emancipatory education.

Continuing teachers education models

In a recent study about continuing teachers education in Brazil, Gutierrez (1996) classifies the proposals in this area according to the prospects of this qualification process and its educational purpose. As to the prospects of this qualification process, the author points out two main trends: continuing education at an individual development level and at a collective development level. The general features, claimed by Gutierrez, from continuing education at an individual development level are the following:

- orientated by national, state or local policies
- University-centred; having the university as the "locus" to carry out the educational process.
- well-defined in relation to teachers qualification needs and managed by specialists not linked to schools
- teacher individual competence qualification privileged
- theoretically-biased tends to widen the gap between theory and practice (pages 14-5)

On the other hand, at the collective development level and its relationship with schools development the following traces are identified:

- study subjects are taken from teachers' daily routine
- teachers qualification proposals are interwoven with school goals
- workgroups are formed and studies are done at school

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- professional performance is seen as a result of the relationship between the subject and his/her working environment (page 22).

Concerning the purpose of the qualification process, the author refers to two different assumptions present in Paulo Freire's claims about the purpose of education: education as a way to allow people to grasp classical cultural products and assure social integration and education as a way to raise awareness aiming at people's liberation.

Similar considerations have underpinned other classifications about continuing teacher education models. It seems interesting to mention, given its similarity to models from Brazilian reality, a study by the French author Chantraine-Demailly (1995) identifying four models as typical ideals of qualification.

The above mentioned author summarizes the former models in the following ways: "university model - theoretical knowledge is built up and passed on by specialists in a customised way, featuring a liberal pedagogical relationship; contractual-normative model - contracts, commercial or non-commercial, under which diverse types of knowledge are passed on; interactive and reflexive model - teachers are committed to a collective elaboration of professional knowledge by providing technical support for that; school model – people hired by a particular institution taking advantage of a legitimate symbolic violence (Bourdieu, 1971) teach undergraduate students certain types of knowledge." (1995,page 45)

An analysis of teachers' continuing education practices developed in Brazil shows the prevailing role played by the school model which is usually matched with the idea of social integration through the propagation of classical culture products.

Technological concepts and practices and continuing teachers education processes

Coupled with continuing teachers education are the so-called educational technologies, these are sometimes seen as a guiding principle, a process or as a plain educational means.

In an article called "Research and evaluation in educational technology" (Baquero, 1989), I carry out an examination of these technologies features , origins and the concept of man underlying its action, its pedagogical project as well as its political assumptions. It can be claimed that the sort of educational technology which has been developed in Brazil since the sixties, in its many

distinct forms, tends to lay emphasis upon a technical and linear pedagogical framework where the educational proposal is developed in a straightforward way starting from formerly set goals, with a behaviorist approach. Task analysis and tests relating to knowledge and cultural heritage transmission are privileged. This educational technology has, as a pedagogical foundation, educational psychology, particularly the behaviorist approach. And as a management foundation, systems analysis besides studies on communication.

The concept of man underlying this proposal is rather static and mechanical; it claims human behavior is controlled and can be explained by the "effect law", based on a comparison between a preservation homeostatic model and a behavior theory consisting of reducing tension or need. Learning involves eliminating a need, through less tension and stimuli. Man is conceived as a shallow piece (just like an empty organism). It sets out from a very limited conception of the educational process, treating it as something linear which can be easily manipulated, emphasis is laid on pre-set goals and control. This technological proposal traces back to an empirico-analytical approach and owes its source to cognitive interests in the practice of control (MacDonald, 1975). It is the proposal of a "modern" educational technology, part of our reality since the sixties, aiming at a rationalization of teaching. In one of its strongest trends, there is a false freedom where students may "choose", once it is one of the suggested alternatives, the syllabus and learning strategy. It also falls into the category of a liberal education, based upon the equal opportunities principle and claiming that each person is solely responsible for his success or failure. Different results, under this point of view, as well as social inequalities akin to natural differences (strength, intelligence and skills) among men having nothing to do with the social, political, economical and historical system (Baquero, 1983a). A criticism concerning, not only the individualization principle, but also the activities, the pace and "efficiency" principles guiding educational practices stemming from a systemic conception of educational technology is presented by Candau (1980).

The author stresses the authoritarian features of this theory showing that, although it seems flexible and personalised, "the subject is actually driven without interfering in the decision making process, be it in the formerly set goals, during the implementation process or in the choice of different alternatives, also formerly determined" (page 14).

Only more recently, with technological evolution itself, a more democratic, less individualistic, socially-biased and participating educational technology is being developed. And yet, it is at the very beginning.

Preliminary conclusion

Continuing teachers education in Brazil faces the challenges particular to any educational system from a developing country – qualifying teachers to work in a system with high drop-out and failure rates, to work in difficult places to get to as well as with an enormous quantity of students coming from low socio-economic levels.

These are the challenges that also amount to the educational technology area. An examination of its role in Brazil in the past decades has shown it was not able to meet these challenges.

Despite a number of technological models implemented in the Brazilian education system, it is important to stress that they have had only marginal and isolated contributions. Their impact has been minimum as referred to by Oliveira (1983, page 289) "efforts made under the flagship of educational technology have not sorted out any problem as a whole" . According to the author, "the country has not exploited the full potential of educational technology to solve relevant problems" (Oliveira,1983, page 273).

Perhaps this rather small contribution owes to the fact all efforts have been made on the "how-to-do" approach without bringing up the issue of who needs it and why it is necessary. Even because hardware technology available at that time would not allow for a more participating continuing teachers education program in the use of those technologies.

Cursed by some and worshipped by others, educational technology has to face up, according to Levy (1993), the foundations of a thousand-year old culture grounded in the oral knowledge transmission. This is remarkably challenging in Latin American countries where there is a strong oral culture background.

Today, new educational technologies tap deeper into the core issue of education for they are at the very heart of the communication processes. They question understanding principles of knowledge itself.

However, the challenge might, at the same time, create new possibilities precisely when the epistemological conception which orientates continuing teachers education processes seems to be worn out.

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Promoting Quality Teacher Education for an Interconnected World

Redefining in-service and pre-service teacher education for a technologically linked interdependent world
Open learning, new technologies and the development of a new model of pre-service education and training: The Open University (UK) experience

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REDEFINING IN-SERVICE AND PRE-SERVICE TEACHER EDUCATION FOR A TECHNOLOGICALLY LINKED INTERDEPENDENT WORLD

Open learning, new technologies and the development of a new model of pre-service education and training: The Open University (UK) experience

By infusing distance education strategies into the whole fabric of pre-service instruction, teacher educators can design constructivist pedagogical methods for students to emulate in their own subsequent teaching. Using a judicious combination of interactive technologies, faculty members can develop and direct student-centred, problem-solving oriented activities for students at remote sites. The failure of teacher preparation institutions to reform their curricula in response to, and in anticipation of, changes occurring in schools may render them irrelevant to the educational transformations predicted for the coming decade.

(LeBaron and Bragg 1994)

Introduction

Open and distance learning worldwide is currently using new technologies to transform the ways in which it operates and works, providing students with routes into learning which offer flexibility in terms of time, location, content and form. Computer mediated conferencing (CMC or e-conferencing) in particular has been added to the conventional open and distance education delivery media (strategically places face-to-face day schools and tutorials, text materials, videos, audio cassettes etc.) with the aim of supporting student-teacher, student -student interaction and collaboration. (See various articles in Computers and Education. Vol. 24, No 3 1995). For those who use this technology to teach, the changing context for learning which it presents creates a critical moment in the development of the pedagogy of teacher education, presenting as it does, a challenge to our own knowledge of learning whilst at the same time providing us with the opportunity to gain further insights into the complex process of becoming a teacher. This paper focuses on the ways in which the Open University's (U.K.) Postgraduate Certificate in Education (PGCE) uses electronic communication to support the development of the 'novice' teacher.

In designing the computer mediated conference component of our pre-service course, we had very little, other than generic models, to draw upon. Currently the use of telecommunications programs in pre-service courses is still

a rarity. No figures exist for this in the U.K. but in the US only 10% of graduates from pre-service education programs felt they could use telecommunications for collaborative learning. (U.S. Congress 1995). So the paper begins by outlining the research into the use of electronic conferencing on a pre-service course which we have carried out in the Centre for Research into Teacher Education (CRETE) as part of a detailed evaluation of our own practices as the teachers of teachers. The second part of the paper is a case study of PGCE (history) students' use of electronic communication. What is presented here is an overview study indicating the main areas where CMC and e-conferencing in particular can make a significant contribution to the development of beginning history teachers. All of the areas identified in this overview study warrant more in-depth analysis as we refine and redefine our practice in relation to integrating CMC within a pre-service teacher education course and develop our expertise as conference moderators.

1. The Open University PGCE and Electronic Conferencing

The Open University's PGCE Program, currently in its fourth year of presentation, is Europe's largest open and distance program of pre-service education. It is taught throughout England, Wales and Northern Ireland. The course is a part-time eighteen month pre-service education course leading to the Postgraduate Certificate in Education and qualified teacher status (QTS). It recruits annually around 1,400 students. Of these students around 400 follow the Primary PGCE (to teach pupils aged 4-11) with the remainder following one of the seven Secondary (to teach pupils aged 11-18) courses (Design and Technology, Science, Mathematics, History, Modern Foreign Languages, English and Music).

Two characteristics of the course have transformed the approach to open and distance learning, leading to the development of what Moon has called "third generation of open and distance courses in teacher education." (Moon 1996). The first characteristic of such a course is the inclusion of a work-based element leading to a professional qualification. In this pre-service course, school-based activity related to the development of teacher competence was required. The course therefore has as a central organising principle a focus on a pedagogic framework which integrates the practical experience students have in school with all other aspects of course provision. (Moon 1996; Burgess and Banks 1996). The second characteristic of this 'third generation of open and distance courses' is its interactive electronic communication component.

Students are provided with multimedia course materials written by national

experts which includes audio, video and text (440 hours of study). The study guide is the equivalent of the method seminar and the articles in the course reader, is the equivalent of conventional face-to-face courses. Across the eighteen-month course, organized into three phases, students complete an eighteen-week teaching placement in a school which has agreed to enter into partnership with the Open University to jointly train the student teacher. This partnership link between the school and the university includes the training and support of experienced teachers (mentors) who provide direct support for the student. The interface between theory and practice is to be found in the School Experience Guide (SEG). This structures the student's school experiences through a range of directed activities which cross reference to the study program as a whole. This work in turn informs students written assignments and subsequent study. Selected activities are then submitted in a Portfolio for final assessment of competence. It is through the SEG, the Study Guide and the Portfolio activities – including the written assignments (Tutor Marked Assignments - TMAs), that the different forms of teachers' professional knowledge are all used to interrogate each other, with the practical classroom knowledge being used to interrogate more theoretically based knowledge.

An OU Associate Lecturer supports the students' study through commenting in detail on their written work, telephone and face-to-face teaching at tutorials or day schools. Increasingly, Associate Lecturers and students communicate and continue their discussions, begun at the tutorials, through electronic conferencing.

All students and tutors are provided with a computer, an integrated software package, a modem and a printer for the duration of the course. Initially, this resource was provided in order to better develop students' competence in the use of IT. They are expected to word process their assignments and portfolio work. However, the addition of the modem and the availability of the "FirstClass" communications program gave students access to an electronic network. It is this facility which is revolutionizing PGCE students' experiences of learning to teach.

" ... an emerging world-view of distance education incorporates highly interactive communications technology along with the ideal of both personal and collaborative learning ... it is argued that computer conferencing may well be the flagship of this post-industrial approach and ideal of education at a distance. It is a technology that has potential to support learners in collaboratively constructing meaning and confirming understanding."

(Garrison 1997)

1.1 The approach to using FirstClass in the Open University (U.K.)

This development of this electronic learning environment is a University-wide initiative. Over 20,000 OU students and staff now use the FirstClass system. The PGCE course, like other OU courses, has created a variety of learning environments which the students can choose to use. This virtual academic community has been created in an attempt to present students with a familiar environment in which to participate. The approach to the design of the desk-top has been to create an electronic learning environment which replicates visually on screen the geography, location and interest groups of a conventional university – a use of metaphor which aims to hide the technology which lies between the learners and their participation in this community and thus facilitate access. So, for example, the student, on logging-on, is presented with a desk top metaphor of a university campus, with various 'rooms' or learning environments, whose titles, such as the 'PGCE Education Forum' or the 'PGCE97 History' are linguistic extensions of that metaphor.

Students have access to the whole ' PGCE University campus', to the subject/phase rooms and the Education Forum. Within the 'regions' there is a map of the UK which directs students to their own Regional room, and within that, their own tutor room.

1.2 Functions of e-conferences within the PGCE

The main characteristic of the computer mediated conferencing which operates within the PGCE on-line community is its asynchronous text-based communication. Students can work on their messages off-line, they can send attachments with their messages, and the conference is open 24 hours a day, seven days a week. They have their own personal mailboxes and the facility for synchronous communication or 'chats'. Within this on-line community then, students are given access to a wide range of different learning environments which offer the following kinds of support:

Social Support - this is achieved through messages posted to individual student mailboxes, 'chat-sessions', through social interactions in the Tutor room and through contact with course academics and other students following the same PGCE course in the Subject rooms.

In addition PGCE students have access to "General Chat" areas for all OU students run by OUSA (The Open University Students' Association).

Course Information - up-dated information on deadlines for assessment

or information about relevant web-sites, TV programs etc. is posted in the Regional and Subject rooms on a Bulletin Board.

Teaching and Learning - within the subject rooms a variety of activities such as discussion on a particular topic - (e.g. IT and Teaching History), sharing experiences of school placements, and access to experts through special "Guest Speaker slots" enable students to explore the issues in relation to teaching their subject speciality.

Resources - documents can be sent as attachments to messages and this facility allows classroom resources, or other teaching and learning resources, to be distributed to students.

Self-help - within the subject/phase rooms, students frequently ask for information on how to approach the teaching of a particular topic in the classroom, or for references to up-date their subject knowledge. The openness of the campus also allows for students to share their expertise across subjects.

1.3 Evaluations of the use of FirstClass

The use of FirstClass over the past four years of the OU PGCE course has generated a large amount of data which has enabled us to evaluate students' use of these e-conferences and to identify defining characteristics of the learning environments. Each of the different subject rooms has its own distinctive atmosphere and organization, which reflect the different subject cultures. (Leach and Swarbrick 1996; Bourdillon 1996b). Other evaluations of the use of FirstClass have explored the key role of the conference moderator (Swarbrick 1996), and the issue of student access and gender differences in patterns of use (Bourdillon 1996a).

School-based learning in the U.K., where novice teachers are guided through their school placement by a mentor (an experienced teacher) has led to the conceptualization of a model for teacher development which draws on sociocultural theories with its emphasis on the social and situated nature of learning through joint activity (Edwards and Collison, 1996). Building largely on the work of Vygotsky, sociocultural theories, which emphasise the social and situated nature of learning, describe how children and apprentices learn all kinds of skills by participating in authentic activities supported by experienced practitioners who match the activities to fit the developmental needs of the learners. (Lave and Wenger,1991). Particularly useful here is Lave's notion of a community of practice as a field in which knowledge is located and developed by those who participate in that community. Applying this notion of

situated learning to electronic conferencing, Leach and Swarbrick (1996) have argued that within the Open University's (UK) initial teacher education course, e-conferencing is mediated to create a supportive environment in which student teachers can 'rehearse' and begin to understand what it is to be a teacher.

The analysis of activity in one subject room, the History Room, which follows, builds on some of these ideas raised by our early experiences of the use of FirstClass and analyzes some of the features of an electronic learning environment which facilitate the development of beginning teachers in particular and of learners in general. It begins with an exploration of the development of students' IT skills.

2. Computer Mediated Conferencing and the development of the history teacher: a case study

2.1 The development of PGCE History students' ICT Skills

An obvious way in which computer mediated conferencing contributes to a preserve courses in teacher education is through the development of students' ICT skills. One of the statutory requirements for newly qualified teachers in the U.K. is to demonstrate competence in Information Technology (IT), together with an understanding of the contribution ICT makes to their specialist subject. This aspect of the beginning teachers' knowledge has been strengthened by the introduction in England of a national curriculum for teacher education. (Standards for the Award of Qualified Teacher Status DFEE June 1997.)

The most recent survey of new teachers' use of ICT suggests that they were ill-prepared for the challenges of the technological revolution:

"Her Majesty's Inspectors (HMI) saw little use of information technology (IT) in lessons observed. Many of the new teachers (45 per cent primary and 31 per cent secondary) reported that they did not feel well prepared in this area and this is reflected in their apparent reluctance to use IT in their teaching."

(HMSO 1993)

These findings are reinforced by Hayden's work with history students' on a pre-service course (Hayden 1996) which also identified that there is no clear correlation between the use of IT during the PGCE year and subsequent practice in the classroom. Explanations for this under-use of IT have considered students' own attitudes to IT and their success in acquiring IT skills. Wild's work however offers a different explanation suggesting that "IT outcomes need to be considered in the context of individual student's constructions of IT meaning"

(Wild 1996). He argues that skills-based courses usually provided by university departments of education may bring superficial success, but what is required is "the need for individuals to make sense of this form of communication: that is, blending the computer into the professional life of its user, making the computer respond to the real needs of the user, rather than vice versa." He also found that experiences of IT, rather than specific pre-service courses in IT are more likely to influence students' and beginning teachers' own use of IT.

One of the most encouraging findings from evaluations of the OU PGCE is the way in which student teachers develop their IT skills across the eighteen months and make use of the computer as part and parcel of their day-to-day lives. Through planning their lessons on electronic templates, through word processing their Tutor Marked Assignments, through sharing and making resources on their computers, students have a clear purpose in using IT to support their work on the PGCE course. It becomes a tool to learning, rather than a tool to be learned. An end of course survey conducted in PGCE history students' confidence in using IT in the classroom indicated that while 42% of the women in the course and 20% of the men had no prior experience of using IT, 87% of the cohort rated themselves as confident or very confident users of IT by the end of it. (Bourdillon 1996b).

In addition, access to e-conferencing enhances students' understanding of the use of IT in teaching history developed through the course materials. Through a 'Guest Speaker' session students have access to a national expert in IT and Teaching History for five weeks between their second and their final school placement. Students are sent pupils' IT resources electronically on three of the History Study Units at Key Stage 3 are invited to work through these in much the same way as would the pupils. They are asked to evaluate these classroom materials as part of a wider discussion on the relevance of IT to teaching history. Although this conference is an additional and voluntary part of the course, well over 70% of the secondary history students, together with many Primary PGCE students with history as their speciality, participated in the discussions last year. The two messages below give some indication as to the impact of this ' Guest Speaker' session on both student and school practice.

"Friday, November 22, 1996. 8. 09pm.

Dear B and All,

I've used two IT programs with Years 7 and 8 only on the old BBCs. What I find amazing is even on technology that came in with the ark, kids still get so excited about their learning. It would be great if every topic/key element had an IT program to use with it, because the benefits are so obvious when the kids are back in the classroom.

Julia"

"Friday, November 29, 1996. 12.33pm.

Dear B,

My mentor and I were delighted with your response and the resources.

I must now add that my perceptions of IT have changed since reading your discussion. I did realise that it was more than word-processing, but needed ideas and inspiration on how to us IT in a more interesting and effective way. I am very impressed by your Civil War and 1066 activities and am going to use your Civil War activity in my next practice in March/April.

I already have ideas on how I am going to plan this into my curriculum planning for my Y8 class. I am going to book the computer room for at least three lessons etc. etc."

From several of the students' contributions to this debate it was clear that not only did students on the whole develop positive approaches to IT which allowed them to use IT on their final school placement, but also revealed that in some cases students had more experience of using IT in teaching history than did their mentors. Monitoring visits to students during their school placement have also revealed this to be the case, which is partly due to the fact that many OU PGCE history students have a history of professional experience, such as working in the local archive office or in industry, which has developed their IT skills.

This approach to using IT within a pre-service course for beginning teachers, many of whom have had no experience at all and many of whom are highly skilled in the use of IT, appears to be having an impact on the classroom practice of OU newly qualified teachers once they are in teaching posts. Preliminary evidence emerging from a survey of past PGCE history students ('94 and '95 cohorts Bourdillon forthcoming) indicates that the somewhat depressing picture presented in the HMI survey of beginning teachers' use of

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IT in their teaching is rapidly changing. These alumni, now in teaching posts, demonstrate a continuing confidence in the use of IT in teaching history.

2.2 Electronic conferencing and the making of history teachers

Evaluations of students' use of FirstClass at the end of the 96B presentation of the course clearly indicate that what students value most about e-conferencing was contact with the subject co-ordinator together with the opportunity to discuss their particular subject speciality with other students. The value placed on the subject speciality areas of FirstClass are clearly closely related to beginning students' identities as subject teachers. Their use of the room indicates that part of the process of becoming teachers is a process of being introduced to and inducted into a particular subject community and its subculture. This pattern of use also bears out Grossman and Stodolsky's (1995) research in which academic departments are characterized by differing beliefs, norms and practices that affect teachers' work and their responses to change. The messages posted in the History room have provided a record of that process and indicated the ways in which students:

- develop their subject specific identity;
- are encouraged to openly discuss the pre-conceived ideas and implicit assumptions about teaching which they bring with them to their pre-service course.

Learning processes

The types of conversations and learning experiences which occur in the History room do not simulate discussion in the conventional classroom. The fact that written text is the mode of communication together with the fact that contributions have a permanency once posted in the room thus enabling readers to return to them whenever they wish to, introduces significant differences in the learning discourse. It is the effect of this written form of the e-conference messages as a learning process which has currently received the most attention from research. "It would appear that the asynchronous (i.e. reflective) and precise nature of this means of communication is consistent with higher order thinking and cognitive development. Since the exchange of messages is less rapid and are stored, learners do not have the burden of remembering the points made by other speakers while waiting for their turn to speak." (Garrison 1997). Casey's evaluations on the use of computer mediated conferencing identifies one of the main aims of such conferencing as "fostering greater reflection on the part of pre-service teachers by providing an electronic arena for discussing issues raised in the course of the methods class, field

experience, student teaching " (Casey 1994). The value of e-conferencing it is argued, lies in the opportunities offered for reflection. "Unlike real-time, face-to-face discussions, the computer-conferencing environments provides time for reflection, as well as relief from the inhibiting constraints of dominating voices." (White 1997).

Reflective practice, based on Schon's interpretation of reflection involving some form of experimentation in which practitioners constantly interpret their situation by means of problem-solving and problem-setting, a process which can lead to a new framing of the situation (Schon 1987), is now widely accepted in initial teacher education courses. E-conferencing can be seen to support this process through two ways of communicating:

- through the writing of carefully worked out responses which have an internal logic and follow the conventions of academic discursive writing. These are 'presentations' with the 'community of history teachers in the history room as the audience;
- through sending exploratory and unfinished writing. These messages are more akin to conversations, or ' thinking aloud', where the audience is often the student herself.

"Presentations"

Within the History room, formally written messages are generally in response to a particular question about aspects of the work in the course study guide, or in response to similar pieces of writing sent to the conference as attachments.

"Am I right in thinking of "meanings" as something along the lines of 'interpretations of events'? If so, I think I favour Sylvester's (article in Course Reader) view that history should be "centrally concerned with communicating ways of thinking and knowing about the past", rather than trying to indoctrinate a particular perception of events. As you say, there is no avoiding the ideology issue at some level, for the study of history needs its content, and there can be no 'view from nowhere'. But in concentrating on the nurturing of investigative, evaluative and interpretative skills, rather than the conclusions those skills lead pupils to reach, I think that personal, school and national curriculum biases can at least be marginalised.

However, if we do accept the role of history teaching as communicating meanings, why does the view of teaching as an art affect this? Surely the teachers' creative artistry is concerned with the process of communication rather than the manufacture or modification of the meanings that are to be

communicated? I have reservations about the whole notion of 'teaching as art', and especially with the concept of 'intuition', but I think they belong to the next chunk!"

Robert, PGCE History student

"In my previous contribution to this debate (Of Course Teaching is a Science) I intended to imply that although all **thinking** (and thus all **explaining** is theory based, scientific thinking is distinguished by its testability (Karl Popper). I would not in reality use 'sod's law' to explain a chaotic classroom situation because it would not help me to prevent the situation occurring again ... I might look to learning theories to see what these say about engaging children in learning, I might look to other teachers for advice and experiment with their ideas. Eventually as an 'expert' I might be thought to 'intuitively' know when trouble is brewing and be able to avoid escalation's, but really my 'intuition' would be based on theory-testing - which is scientific."

Karen PGCE History student.

It has been claimed that these expository style statements stifle discussion (Poster 1990), but in learning to teach history, 'presentations' are valuable in enabling students to rehearse and develop their basic understanding of the different kinds of knowledge history teachers use. In these examples, the students are sharing some work they have on the nature of school history in one case and the values of learning theories on the other. In this way, students rehearse the way in which history teachers reconceptualize their academic subject knowledge so that teaching and learning can take place. 'Presentations' then are engaging in meaningful collaborative learning which is adding to the knowledge and creating new understandings among the members of this on-line community of history teachers.

An analysis of the 1996 messages posted by students shows students engaged in 'presentations' about the following areas of history teachers' knowledge:

- pedagogic content knowledge;
- subject knowledge - information about Richard II, the Romans, the Peasants' Revolt, etc.;
- knowledge of school history - discussions around black and women's history and ideas of 'national identity'; the emergence of 'living history' as a statement about identity in the late 20th century;
- organizational knowledge - discussions on setting up group discussions in history and organizing school visits to historical sites.

Conversations and 'thinking aloud'

Other contributions to the history room are more 'conversational'. These messages often include open-ended statements which raise questions and invite further responses to a particular theme. In a sequence of messages, students add to the points raised and develop their own points of view. In developing their ideas, students range across the course materials, their own knowledge and understanding of history, and particularly their experiences of teaching and the practice in their partner schools. In this example, students are exploring the use of IT in Teaching History in response to some input to the conference from a national expert in a "Guest Speaker" session.

Friday, 22 November 1996.

"I have been very impressed with your thoughts B—. I have been inspired to start thinking about how I can use some of this in my next School Experience. I'm trying to develop some ideas on teaching essay writing skills to my Y20 GCSE class, details are attached. Any ideas anyone?"

Bill, PGCE History Student.

Sunday, November 24 1996.

"I've just read Bills' thoughts ... Here are mine ... "

Naomi, PGCE History Student.

Friday, November 22 1996.

"I have just read quickly though the messages so far so have not yet had time to digest further the info B' has given us. This as been a hectic week for me as H will understand!! My first thoughts are general as I would like to reflect and contribute a more in-depth analysis tomorrow. Firstly IT is with us whether we like it or not. Schools may not have the facilities yet, my history dept. has one computer which is not used. The first thing many of my Y7 pupils ask is can they do their homework on the computer? I encourage this as much as possible. Looking at B's suggestions, the options word processing has opened up gives us endless opportunities."

Anne-Marie, 1996 PGCE History student.

Wednesday, November 27 1996.

"I was wondering about using the census returns for one of our local towns as part of a history lesson? In particular I thought we could address the issue of change and continuity by looking at the jobs people did, say in 1850, and

then seeing how they had changed by 1880 for example: the pupils could use IT to draw graphs showing the numbers of people in any particular profession"

Carey, PGCE History student.

Thursday, November 28 1996.

"I think this is a great idea. I had a few problems when I tried something similar ... But I'm sure it's worth persevering".

"I attempted to use census returns in preparing work for a Y9 group, I wasted a lost of time at the start of my planning". I wrote the following:

"My greatest error was to search for Southam (semi-rural town in Warks.) sources which were both interesting and readily available and their use with my Y9 would be historically valid. There are great gaps in the available materials for Southam. At this point I should have changed tack and turned to much better documented Leamington!!"

Julia, PGCE History student.

The unfinished and questioning nature of the posted messages, the broadcasting of initial thoughts, experience and ideas, invites contributions from other students. Here, the written response takes on a different form from the more carefully worked out 'presentation'. Students are using e-messages initially as a tool to sort out their impressions, for developing their initial feelings into ideas and for gaining new insights and understandings in relation to themselves and the world of teaching history.

These messages offer us insights into beginning teachers' thinking about teaching and learning. Within these 'conversations', learning can be seen as 'transactional' (Bruner 1987). There is a complex interweaving of language, interaction and cognition. Learning involves the sharing and testing of intersubjective meanings and the negotiation of meanings through interaction and empathy. Within these sharing and testing 'conversations' students' misunderstandings together with the assumptions about teaching and learning which they bring with them to the course are also raised. It is this aspect of e-conferencing, as much as the claims made about reflection, which makes it a key learning environment for beginning teachers.

A 'permissive' learning environment

When the issue of the use of IT in teaching history was introduced by a Guest Speaker in the History Room, many students expressed negative attitudes towards the relevance of IT in teaching history, attitudes which often reflected

the scepticism of their mentors. A reluctance to enter into the debate was frequently characterised by a concentration on the lack of IT resources in school; students' partner schools did not have the necessary equipment, or the machines were old and out-of-date, or pupils did not have the basic IT skills required to use software, etc. At its most extreme, the relevance of IT to teaching history was rejected as being unable to support the intellectual demands of the subject. In other words the use of IT did not support the contextualized understanding and analytical discursive writing required for the communication of history.

Message to the History Guest Speaker Room

"Friday, November 22 1996

What is there to enthuse about?"

"Dear H

"Sorry to say this but I am yet to find any IT that I find in anyway remotely interesting.

"Sure I find my Apple Mac useful to write TMAs, produce worksheets and write letters etc. I also would not write such things by hand ever again. But I don't find it interesting at all.

"Furthermore I have yet to see any good examples of IT in use. Sure my partner school has three rooms of 15 pentium PCs. What do the students do? - word process and search through databases. They spend ages on it get bored and mess about looking up irrelevant material (and printing it off).

"There must be more to it than this - this is so boring!

"I also feel that students spend inordinate amounts of time producing beautifully word processed and intellectually lightweight essays. I would much rather receive a well written essay that was academically far better although less attractive on the eye.

"I feel very much feel like the lost generation of Americans in the 1920s.

Michael, PGCE History Student".

While the issue of IT resources and teacher expertise for using IT in teaching history is real, these factors don't apply to students' own use of IT software in this particular instance. They should not therefore be an obstacle to exploring the principles about the relevance of IT to history - particularly its use in supporting the communication of history. The expression of such negative views

and strong beliefs about the use of IT, reminds us about student teachers' assumptions about teaching. Beginning teachers bring with them to pre-service courses strongly held views of teaching and learning which have been formed by their own experiences of school. Indeed one of the greatest challenges facing teacher educators is to encourage student teachers to re-examine their own beliefs and implicit theories about teaching and learning.

Within the Guest Speaker conference on IT and Learning History, several students expressed their beliefs and views, even though they knew these to be very different from the ones held by the Guest Speaker and from the ideas expressed in the course materials. As Swarbrick (1996) has pointed out, pedagogic authoritarianism, viewing the students as 'novices' who need instruction, is impossible to sustain through e-conferencing. It is often the students who set the agenda and who set the focus for discussion.

"In problem-solving situations at synchronous conferences, pressures are great to conform to existing paradigms or to an emerging consensus. By contrast, computer conferences with the veil of anonymity and the temporal and spatial distance they provide, encourage open criticism and the presentation of unpopular or eccentric points of view". (Poster 1990)

Computer conferences do have a permissive atmosphere precisely because they encourage a 'student driven' interaction. In setting the agenda and directing the focus of discussion, it is more likely that students are willing to express their own belief systems and values. As such, e-conferences provide an open learning environment where assumptions and inherent beliefs can be explored and challenged in a collaborative endeavor of rethinking experience.

Collaborative learning

A final thought on the value of e-conferencing in an initial teacher education picks up on the collaborative nature of the learning which takes place in the History Room. The series of messages on a particular theme, be it on the practical difficulties of resource management, or the exploration of the educational rationale for adopting particular teaching strategies, is a collaborative process. Understandings are developed, shared and taken further, challenging existing beliefs and providing a process for creating new ones. In working collaboratively in the History Room, student teachers are provided with a framework for learning which moves them away from the assumption that teaching is an individual responsibility. Through their interactions and their sharing of different expertise, students learn the value of creative teamwork and in so doing begin to model a process of development which research has shown is a necessary characteristic of the effective school.

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"In effective schools, collaboration is linked with norms and opportunities for continuous improvement and career long learning. As a result teachers are more likely to trust, value and legitimise sharing expertise, seeking advice and giving help both inside and outside of school. They are more likely to become better and better teachers on the job."

(Fullen 1992)

Conclusion

From this evaluation of students' use of computer mediated conferencing is there then an emerging pattern of practice? This analysis of outcomes of students' use of the History Room suggests the following:

- **Integral to professional lives**: Use of technology in pre-service teacher education courses suggests IT can be organized in such a way as to make it an integral part of their professional lives. In this way beginning teachers are able to use technology to transform education and schooling for pupils drawing on the way their own experience of technology has transformed their own learning in becoming a teacher.
- **Induction into subject cultures**: Within the on-line learning community of pre-service teachers students prefer to identify with their own particular subject culture. These learning environments develop a clear subject identity through engaging student teachers in discussions about the nature of their subject and the subject specific issues and concerns.
- **Collaborative learning**: Teaching and learning within the subject rooms should provide models of teacher development. The collaborative nature of the learning which takes place in the subject rooms develops a view of teaching as a process of creative teamwork.
- **An open learning environment**: Students are able to set the agenda for the discussion, a process which facilitates the exploration of student teachers' implicit beliefs and assumptions about teaching to be explored and challenged.
- **An established organization for the exchange of messages**: The setting-up of specific sub-conferences where students know they will have access to subject expertise, which will be carefully structured, which will engender a creative tension between theory and practice, between what students see in schools and what they read about in the course materials and fit into a definite time-slot.

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Reforms and Innovations in pre-service Teacher Education: Bridging the gap between Theory and Practice

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Concern over a country's schools and the quality of teaching within them has been translated into questions of who prepares our teachers, in what manner, and how well. To my mind, in such a critical domain as teacher preparation, we must innovate not just for innovation's sake alone. Rather, proposed innovations must be reform proposals that answer the forementioned concerns.

Many of the suggestions made are probably all too familiar. Moving in new directions appears tied to whoever is currently running the education department. It is not as if such a trend is totally objectionable, on the premise that education leaders in this country are experts in their own right. But most assuredly, reforms and innovations should be based on more research into programs of teacher education. Multiple forms of inquiry, ranging from historical analysis to conceptualizations, to descriptive and ethnographic studies, to quasi-experimental and well-designed experimental efforts are needed.

Admission Standard Retention and Certification

Previously, the blame for perceived failure in schools has fallen on teachers and students in teacher education institutions. They must be brighter, more knowledgeable, more willing to change in whatever direction authority prescribes. We rarely ask how teacher educators might best prepare students who are between below average and average in academic capability, driven by varied motives to become teachers, though quick to tell screening committees that "they want to join the noblest of all professions."

Admission standards in teacher education programs have been criticized as established at inadequate levels or administered in such a careless fashion as to be literally useless. Other critics protest that quantitative criteria are used too heavily. Admission criteria have been chosen because they are an inexpensive

way of screening large numbers of students. A related concern is that too often evaluation for admission is a one-time event, making the issue of selection therefore closely linked to that of retention and certification. Upgrading admission standards is desirable, but it is not the whole solution. What is needed are criteria that better predict teacher success. The much used GPA and standardized tests reveal only a small, though important, part of the candidate's fitness to teach. *Perhaps the best reform and innovation is to make evaluation an ongoing process.*

Efforts should be made to determine the relationship of various attitudinal and personality factors to the candidate's fitness to enter the teaching profession. Research has shown for instance, that students who are either extremely submissive or extremely dominating are not likely to be successful in teaching (Coody and Hinley, 1967). A low level of moral development has likewise been associated with a general lack of competence. Positive self-esteem is consistently related to success.

Admission should not be equated with accepting a candidate as a good risk as a prospective teacher. Certainly, anyone who meets the minimum requirements of entry into a college should be free to enter the teacher education program and attempt to meet its requirements. In fact, proposed innovations could allow such entry into the program at any point in the applicant's life. However, whether a person in the program succeeds depends on his ability to perform the criteria specified for exit from it. If these criteria are met, independently of how long it takes, he will receive certification; if they are not met, and those in the program decide ultimately that there is little likelihood of their ever being met, a student may be asked to leave the program without full certification. Under no circumstances, however, are these judgements to be made prior to each student having had the full opportunity to demonstrate his ability to meet the criteria set for certification.

In a proposal by Razik (1985), individual differences in the learning patterns of students in a teacher education program are more than recognized. The scheme includes opportunities for students, within established limits, to: 1.) contribute meaningfully to the design and development of a "personalized" teacher program; 2.) determine that which they wish to take from the program; 3.) determine the setting within which the competencies negotiated are to be demonstrated; 4.) determine the criteria by which judgement is to be made about competence; 5.) continuously assess the relevance of the objectives that have been determined, and the relevance of the educational experiences being

pursued in relation to those objectives; 6.) develop a minimum of self-understanding as a basis against which to make such judgements; and 7.) develop an overall "style" of teaching that is in concern with one's self-understanding. Two requirements must be met if a personalized program is to be effective: 1.) vast amounts of information on interests, performance history, etc. must be available to students and staff on demand so that informed decision-making can be pursued; and 2.) the staff must have the sensitivity and capabilities that permit meaningful negotiation. It is to be recognized, however, that certification is linked only to the demonstration of *terminal* competencies; pre-requisite knowledge and skills are seen only as means to an end and are attended to primarily for diagnostic or guidance purposes.

Teacher Education Curricula

If teacher training is to equip teachers to adopt the innovative stances necessary to respond to the needs of pupils, industry and society in the 21st century, what is required is a much more fundamental and radical appraisal of its curriculum (R. Alexander et al, 1984).

Our system of education does not place its prime focus on developing the skillful person; it rests upon a standpoint which places reliance upon a knowledge-based rather than a needs-based curriculum, and is evaluated and assessed by developing "close circuit" learning programs in which only attainment that is susceptible to measurement is included. The process is supported by a false dualism where the words "training" and "skill" are used pejoratively and equated with physical movements and manipulative activities, appropriate for use by those who are "good with their brains" and are better able to follow proper, more noble academic pursuits. This false dualism which detaches mind from body, thought from action, is in turn reflected in the way in which pupils, their educational processes, the education hierarchy in schools and the status accorded to these pursuits, are all categorized, designed and structured, and most importantly, rewarded. The examination-based curriculum signals the values of schools. We should remind ourselves that examinations are important not only for those who are successful but also for the very substantial number who fail. The individual is swallowed by the group. These values are also revealed in the relationships adopted.

When such relationships occur in institutional contexts, they are affected by the nature of authority that prevails. Being a teacher draws on both these dimensions, and reinforces them with the notion of superior knowledge. Where that knowledge dissemination is employed didactically, where the learner is at

the same time a listener and the expert a talker, an inevitable consequence occurs. The listener is cast not in the role of doer but of passive receiver in which he rarely becomes a participant in his learning process of problem-solving. The result is that the pupil seldom feels like the owner of the solution. The rejection of schooling and school teachers by many of the recipients has such deep-seated roots.

That is why the advocacy of participatory, experimental learning, with carefully negotiated learning contracts, are of such crucial and immediate importance. They should start with the earliest school experiences, and culminate in the transition from school or university to an outside world of work and responsibility. They require different forms of evaluation, including self-evaluation, and different interpersonal styles between learner and teacher if they are to succeed. There can be no negotiation over curriculum, or anything for that matter, where there is no parity of esteem. The roles of expert and amateur are clearly not equal, but the roles of teacher and learner, at all levels and most especially in teacher training institutions, can and should enjoy parity if adult status and self-perception are to be attained.

Teacher educators, in partnership with their colleagues in elementary and secondary schools, should be developing teachers who are able to take part in a total learning process, who will operate and be functional within the increasing demands of a specific and technological society. Teacher training needs a concept which embodies the notion of developing transferable people, who can interchange with others, or with other occupations. This implies a requirement for approaches which would provide generic training, where teachers could be trained alongside others who would have similar occupational needs for the same levels and kinds of transferable skills approaches to encourage a real interchange of people within the professions.

Teachers of field-based cooperative schools must of necessity become full partners of teacher educators in teacher training institutions. Operationally, this requires the former's representation in all decision-making that affects the curriculum of pre-service teacher education. Mechanisms will have to be established which permit equal participation in: 1.) establishing the competencies that are to be demonstrated under laboratory conditions; 2.) establishing the behavior or products of behavior that are acceptable as evidence of those competencies; 3.) confirming the demonstration of competence under laboratory conditions; 4.) establishing the competencies to be demonstrated under actual field classroom conditions; 5.) establishing the

behaviors or products of behavior that are acceptable as evidence of those competencies; 6.) confirming the demonstration of competence under field conditions.

The faculty of teacher education will have to become involved in contract negotiations and the development of instructional systems.

For their part, field-based teachers, instead of being relatively passive hosts to student teachers, will become actively involved at all levels of decision-making relative to the teacher training instructional program. The assumption of responsibility for this function will require a major change in the operation of elementary and secondary schools, a redistribution of resources, and a major involvement of teacher training colleges and universities in the in-service education program of teachers through their institutions' teacher centers.

Howey and Zimpher (1986) have outlined the following conditions and practices of effective curricula and programs of teacher preparation that they surveyed:

1. Clear conceptions of schooling/teaching are the driving force for structuring and interrelating curriculum strands or elements.
2. Faculty coalesce around experimental programs. For instance, faculty do not identify themselves as the elementary faculty, per se, but rather as the faculty in the experimental elementary education program.
3. A sense of reasonableness and clarity is associated with the major goals of the curriculum and program. Students are able to share with considerable specificity what they believe to be major goals.
4. The curriculum is rigorous and academically challenging. Specific milestone points and benchmarks for success are underscored and high achievement symbolically highlighted.
5. Themes run throughout the curriculum in which key concepts are tied together throughout a variety of courses, practicums, and school experiences. For instance, these themes can be articulated in terms of a basic respect for individual diversity or in the primacy of the learner as a major source of the curriculum.
6. There is an appropriate balance and relationship between general knowledge which can be brought to bear pedagogically, pedagogical knowledge, and experience designed to promote pedagogical development.

7. Organizational and structural features of the programs enable an interdisciplinary or integrative approach to the curriculum which allows students to address, repeatedly, core teaching functions and concepts, such as planning for instruction across different subject areas.

8. Adequate "life space" is found within the curriculum. How much study of different subjects one can engage in productively at any given time is considered in tandem with the ordering of the curriculum's content, concepts, and activities since inadequate time means the collapse of sequence, and inquiring and reflective teachers are antithetical to a compressed curriculum.

9. Adequate curriculum materials, instructional resources, and information and communication technology, and a well-conceived laboratory component. Laboratory and clinical opportunities are so structured as to flow continually and centrally throughout pre-service training. Teacher-and student-made materials are organized, displayed, and utilized via the Teacher Center which also serves as a Workshop Center where student teachers and practicing teachers productively engage in curriculum development.

10. There is curriculum articulation between the activities which occur on campus and those activities which occur in field-based cooperative schools. Feed-forward designs enable pre-service students to deal with pedagogical principles and curricular concepts in the college classroom in the morning and in the afternoon, practising, if not experimenting, with them in classrooms. For their part, the faculty of teacher training institutions provide continuity and articulation in the curriculum by teaching in the field-based cooperative schools and working closely with teachers. It makes little sense for people who see themselves as experts in teaching methodology not to be committed to a stronger partnership with their colleagues in the field.

11. Direct linkage with research and development into teacher education as more coherent program development will, in turn, facilitate replicable programmatic research and development.

12. Systematic program and curriculum evaluation exists. Formative feedback of various types is provided to faculty on a continuing basis in terms of the effects of the curriculum and program. At the same time, comprehensive and formalized schemes of evaluation that critically examine key aspects including follow-up studies of graduates are carried out.

Competency-based Teacher Education

A movement called "competency-based teacher education" (CBTE) or "performance-based teacher education" (PBTE) emerged during the late 1960s. PBTE-CBTE is based on the assumption that the content of teacher education programs should be delivered from the actual or conceptual role of teachers, that requirements should be stated as explicit objectives, that instruction and assessment in the teacher education program would be linked directly to objectives, and that student progress would be determined by demonstration of objectives.

The CBTE-PBTE movement led to the development of written statements of explicit objectives of teacher education programs. Four types of objectives were identified: 1.) Cognitive-based objectives where the student is expected to demonstrate knowledge and intellectual abilities and skills; 2.) In performance-based objectives, the student is required to do something rather than simply to know something with emphasis on observable action; 3.) in consequence-based objectives, the student is required to bring about change in others. A prospective teacher's ability to teach is assessed by examining the achievements of students he instructs; 4.) objectives in the affective domain are embedded in all other classes of objectives.

In the model outlines by Razik (1985), the competencies to be realized are not specified; they are considered the prerogative of the institution. The model does specify, however, how such competencies are to be determined. The entire teacher preparation program should be sensitized to the conception of the teaching tasks and the conception of competence in the performance of such tasks. A task is defined as bringing about a specified outcome under a given set of conditions. Competence is defined as the ability to carry out such tasks. When applied to the development of learning outcomes, a competency means, operationally, that the prospective teacher is able to bring about the specified learning outcome for a given pupil or set of pupils who have given characteristics in a given instructional setting. The same holds when referring to competence in the performance of non-instructional tasks. The demonstration of competence, therefore, is always characterized by an appropriate mix of behavioral influence, desired outcome, characteristics of the target clientele, characteristics of the setting within which the behavior occurs, and requires for its demonstration an appropriate sampling of outcomes across given classes of educational settings. In addition to specifying competencies and the content relevant to them, the model also specifies that criterion competencies be

demonstrated under simulated and real life educational conditions.

Technology in Teacher Education

Significant factors currently affect a lack of planning, coordination, direction and support of research on the applications of technology to teacher training: absence of coherence in pre-service program design, the semantics of technology, funding priorities, costs, faculty development, and a lack of systematic research programs on the impact of technology on teacher training (Brooks and Dopp, 1989).

Most pre-service programs are characterized by a lack of a coherent information base or system of maintaining it and it is unrealistic to expect such a condition to be completed by a systems-designed technology.

The schemata in Figure 1 (Annex A) is a design for elementary and secondary education programs. The four levels in the figure represent the four years of professional training from entry level courses (the rectangles) through to student teaching (the shaded cone) and out into entry year. The arrows represent the flow of the professional knowledge base to advance levels of professional training. Faculty select the "knowledge base" (the area of the course represented by the darkened areas inside the rectangles) for the system, a computer network is designed to carry the professional knowledge base throughout the system. The computer network then provides access by any user to any file in the system. The network extends to the student teaching site and carries curricular information from as far back as the freshman year, entry level course. The features of a well designed computer network thus complement the thematic/system design of the pre-service program.

Teacher education must lead, not be led, in the information age. In this age, it is important to have good information; it is equally important to be able to manage that information. All prospective teachers should learn about the effective and emerging uses of technology. Every teacher training institution should develop relationships with as many schools that use technology as possible, to use experts as adjunct faculty, and to provide internships in such technology for undergraduate and graduate students.

Continuing Teacher Education

Teacher education should not be time-bound. There should be a continuum between pre-service education, induction, and continuing education (Philippine EDCOM Report, 1993). Related to this is the move towards post-baccalaureate pre-service teacher education programs which at this time is still tentative. This

move should not be confused with the direction of teacher education. It signals a fuller transition of a change that began when we moved from normal school training to baccalaureate preparation. The move to post-baccalaureate programs suggests that some four-year institutions should now start to work cooperatively with post-baccalaureate institutions, and again the change of direction in teacher education should be broadening the knowledge and abilities teachers have and in how particular intellectual qualities, not just teaching behavior, are developed in various contexts over time, not only in conventional classrooms, laboratories and clinics.

Conclusion

To secure the future or any country, we need a new generation of teachers honed in innovative programs and able to work in diverse settings and at the same time, confident of their roles and contributions. To secure the future of our teachers, a new generation of teacher education programs is essential. A nationwide commitment to Centers of Teacher Education all over the country would be very timely.

It is only when we can train competent teachers and get them to sustain their competence, that we can hope for a better generation in the next millineum.

Thank you

Crescencia V. Chan-Gonzaga

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TOPIC 1. USING COMPUTER SIMULATED INSTRUCTION IN CERTAIN TECHNICAL CONCEPT LEARNING FOR FUTURE VOCATIONAL TEACHERS

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ABSTRACT

In this study, the difference of learning outcomes between traditional small-group lecture/text instruction and computer-simulated instruction (CSI) were investigated. A total of 20 sophomore students, majoring in Industrial Technology Education at the National Changhua University of Education in Taiwan, were selected from 78 candidates and grouped systematically as experimental and controlled objects. The instructional topics involved were on refrigeration technology. A commercial simulation software package was introduced to the experimental group. Two sets of pre-tests and post-tests were administered before and after the delivery of traditional small-group and computer-simulated instructions respectively.

Analysis of Variance (ANOVA) was applied in data analysis in which the standardized scores of pre-tests were set as variates. Both pre-tests and post-tests were criterion-based. In the Johnson-Neyman analysis, the two values of XD indicated that students with better prior knowledge, the CSI method gains much more than the conventional method. On the other hand, for students with little prior knowledge, the traditional small-group method is more suitable.

The importance of appropriate teaching method according to student's ability and aptitude was revealed by the results of this study. Which works better? Traditional small-group instruction or computer simulation? It depends.

Key words: CSI (Computer-Simulated Instruction), small-group instruction, learning outcomes.

I. Introduction

Many researchers have talked about traditional instruction as well as computer-assisted instruction. However, direct comparison of the two has been rare if it exists at all.

This paper will compare the effectiveness of the traditional small-group textbook instruction approach with computer-simulated instruction (CSI).

1. Small-Group Instruction

Small-group instruction has been around for years. Abercrombie, M. & Terry, P. (1978) revealed several helpful tips regarding small group instruction. They are student preparation, control of content and process, participant interaction, the first 10 minutes, peer tutoring, and discussions in new and mature groups.

There are difference types of small-group instruction. Yorke, D. M. (1981) listed eight small group instructional techniques – buzz groups, brainstorming, horseshoe groups, syndicates, topic groups, case studies, simulation, and games. The instructor should carefully choose the appropriate technique and related activities to fit the need of students. Some important factors, such as instructors' roles and responsibilities, practical matters, such as group size and discussion location, ways to monitor small groups, leaderless groups and ways to train students for small group work have been listed by Rudduck, J. (1978).

The success or failure of small-group instruction greatly depends on the cooperation of group member. Johnson, D. W., Johnson H. E., Johnson, R. T., & Roy, P. (1984) believed that cooperative learning is one specialized application of small-group instruction.

Traditional small-group lecture/textbook instruction allows the instructor to have greater flexibility in moving students along academically. Students who need more time to master skills do not feel pushed, and they may jot down passages and take notes freely. This seems to make it easier for some students to grasp solid as well as abstract information of the subject.

Among traditional instructional methods, the difference of learning outcomes is not severe. Glidden, J., & Gainen Kurfiss, J. (1990) concluded that group work is at least as effective as lectures. However, while traditional methods still prevail the use of the computer in education is gaining popularity day by day.

For educational equality, students in both control and experimental groups

were given the opportunity to experience the shortened counterpart instructions upon the completion of this study.

2. Computer-Simulated Instruction

An increasing category of academic and educational disciplines is now computer-assisted and problem-based. Technical education is one of the disciplines that deals with practical problems almost all the time. The progress of computer technology has become so versatile that the use of computers seems to be inevitable in delivering a great portion of technical contents. Gagné (1985) believed that effective learning of subjects should involve different learning theories. However, the effectiveness of learning outcomes derived from alternative instructional designs, is still debatable among teachers and students. Despite the overwhelming trend of computerization, traditional styles of instruction continue to be widely used. This is especially true in the curriculum of teacher preparation institutes.

Simulation is an important function of a computer. A well-made software can visualize and depict the challenges posed by complicated, expensive, or even dangerous experiments. Some theorists have contributed to the development of computer-assisted instruction, which could include simulation. According to Bruner (1966), all materials could be represented in some form for learners through "discovery learning." Computer simulation serves a significant role in discovery learning. The length of time spent on preparation and learning could be a critical factor that will have an impact on students' interest. Computers can partially solve the time consumption problem.

Bloom (1976) proposed that a school learning model contained three elements: (1) student characteristics, (2) instruction, and (3) learning outcomes. The learning outcomes consist of three aspects: (1) level and type of achievement, (2) rate of learning, and (3) effective outcomes. Instructional design is the key of success or failure.

Among various instructional approaches, computer simulation has been extensively used in science for a while. As Gould and Tobochnik, (1987) stated "Computer simulation is now an integral part of contemporary basic and applied science and is approaching a role equal in importance to the traditional experimental and theoretical approaches."

Although the computer can be used to teach a course, part of the goal of this study was to create an environment in which the user teaches the computer to simulate a certain system.

"An active involvement with computer simulations leads to a greater intuitive understanding of physical concepts."

The features of personalized simulation software are instructor designed scenario, instructor assigned practices and access control, individualized access and progress, self-paced learning for students, on-line help and flexible change of settings, and dynamic, programmable simulations. (FAMIC, 1997)

In this study, the computer-simulated instruction assists students to visualize and evaluate the influence of refrigeration cycles, temperature, pressure and enthalpy/entropy change of a refrigeration system. The courseware vender claimed that engineering consultants have evaluated the product and ensured that the software was strictly true to the actual conditions of a typical commercial structure.

3. Research Questions

This study aimed to answer two questions: What type of instructional approach will lead to better effectiveness? And, what kind of entry-level students will benefit most from what instructional approach?

II. Methods

1. Subjects

The subjects were selected from volunteers of the Department of Industrial Education and consisted of 24 sophomore students majoring in technology. Subjects were heterogeneously divided into two categories of different entry abilities. All students were graduates from vocational high schools and had taken fundamental college physics. None of the students had acquired refrigeration knowledge prior to the experiment.

2. Materials

The Refrigeration Lab of the Department held the needed documents and facilities. "Handbook of air conditioning and refrigeration" (Wang, S. K., 1993, McGraw-Hill, Inc.) and "Refrigeration systems" (Hsieh, Y. P., 1992, Chuanhua Publishing Co.) were selected as the texts for the traditional small-group instruction. Regular traditional lecture/text instruction was delivered both in a classroom and in the Lab. The curriculum was so arranged that all chapters and sections would correspond with what appeared in the courseware for CSI students. The courseware (RefrisimTM, 1992, Ver. 1.02), with a protection key,

can be accessed by only one user (student) at a time. Each student accesses independently without login name or password.

The subjects studied by students of both categories were: Heat, Refrigeration Components, Evaporator, Compressor, Condenser, Metering Devices, Refrigerant, Enthalpy/Entropy Chart, etc.

3. Experimental design and procedures

All students took a generalized pretest for pre-requisite placement of entry level skills. Then the experimental group received experimental treatment (CSI), and the posttests, while the control group received no treatment (traditional small-group instruction) and the posttests.

The variables of the study are as follows:

(1) Independent variables: scores of generalized pretest.

(2) Dependent variables: scores of comprehensive posttest.

There are different levels of instruction. According to Tamir (1989), instructional strategy can be categorized into four levels (from zero to three). The process in traditional small-group instruction was of level zero, i.e. students were provided all available hints and discussion. On the other hand, students in CSI were of level two. Therefore their learning was fully independent and somewhat individualized although without registering with the instructor. Sample computer simulation settings, images and pages are given in Appendix I.

Each level of instruction could be further divided into three aspects: problems, way, means, and answers. The comprehensive posttest was an evaluation process mainly in written format that applied all three aspects mentioned above.

The experiment had proceeded four hours a week for two and a half months before the comprehensive posttest took place.

Two students (subject numbers C03 and C07) in the CSI group, and another two students (subject numbers T04 and T08) in the Textbook group dropped out of the experiment prior to completion. As a result, the valid N for each group decreased to 10.

III. Results and Discussion

1. Results

After the tests, the collected data were analyzed by three consecutive statistical methods: Analysis of Covariance, Regression for homogeneity, and John-Neyman Technique. The report, based on the results and discussion, is as follows:

1. Test of variance (ANOVA) after adjustment (refer to Tables 2 and 3),
2. Regression for homogeneity (refer to Table 4), and
3. Cross point of regression lines and differential significance points (refer to Table 5).

Table 1. Raw Scores of Pretests and Posttests

Subject No.	Pretest	Posttest	Pretest	Posttest
	X1(CSI)	Y1(CSI)	X2(TEXT)	Y2(TEXT)
C01/T01	15	33	12	40
C02/T02	33	66	45	48
C04/T03	51	70	32	44
C05/T04	66	94	45	54
C06/T05	44	56	27	40
C08/T07	25	46	59	54
C09/T08	20	46	22	46
C10/T010	40	72	50	60
C11/T11	58	85	62	54
C12/T12	40	62	14	40

For Tables 2 and 3, F ratios were calculated to test the significance by using the equations as follows:

To verify the ANOVA,

$$F = \frac{SS'_{b(Y)}/(k-1)}{SS'_{w(Y)}/(N-k-1)}$$

And to test the within-group regression,

$$F = \frac{SS'_{b(Y)}/(k-1)}{SS'_{w(Y)}/(N-k-1)}$$

Table 2. Analysis of Covariance

	Pretest	Posttest	Pretest	Posttest
Subject No.	$X_{1(CSI)}$	$Y_{1(CSI)}$	$X_{2(TEXT)}$	$Y_{2(TEXT)}$
SUM=	392	630	368	480
Sqr'd SUM=	17796	42802	16452	23504
MEAN=	39.2	63	36.8	48
SUM(xy)=	27271		18664	
SUM(X)=	760		N=	20
SUM(Y)=	1110		n1=	10
SUM(X2)=	34248		n2=	10
SUM(Y2)=	66306		SUM(XY)=	45935
k=	2			
s_1^2=	269.9556			
s_2^2=	323.2889			
sp^2=	296.6222			
t=	0.311598*			
Table $t_{(1-\alpha)}$=	2.12			

* t < Table value (H_0 not rejected)

Where,

$$S_1 = SS_{w(Y)} - \sum \frac{(SP_w)^2}{SS_{w(x)}} \qquad S_2 = \sum \frac{(SP_w)^2}{SS_{w(x)}} - \frac{(SP_w)^2}{SS_{w(x)}}$$

Table 4. Homogeneity Test of Regression Coefficient

$SS_{w(x1)}$=	2429.6	$SS_{w(x2)}$=	2909.6	SS1=	503.2086
$SS_{w(y1)}$=	3112	$SS_{w(y2)}$=	464	SS2=	679.0573
SP_{w1}=	2575	SP_{w2}=	1000	F=	21.59128
$SS''_{w(y1)}$=	382.8985	$SS''_{w(y2)}$=	120.3101		
b_{w1}=	1.059845	b_{w2}=	0.34369		
a_{w1}=	21.45407	a_{w2}=	35.35221		

Table 5. Johnson-Neyman Analysis

X0=	19.40661	C=	9.6979
A=	0.40619	XD(H)=	28.13205
B=	-5.88484	XD(L)=	0.848839

Graphically, Fig. 1 shows the resultant data with intersection and non-significant zones for both instructional approaches.

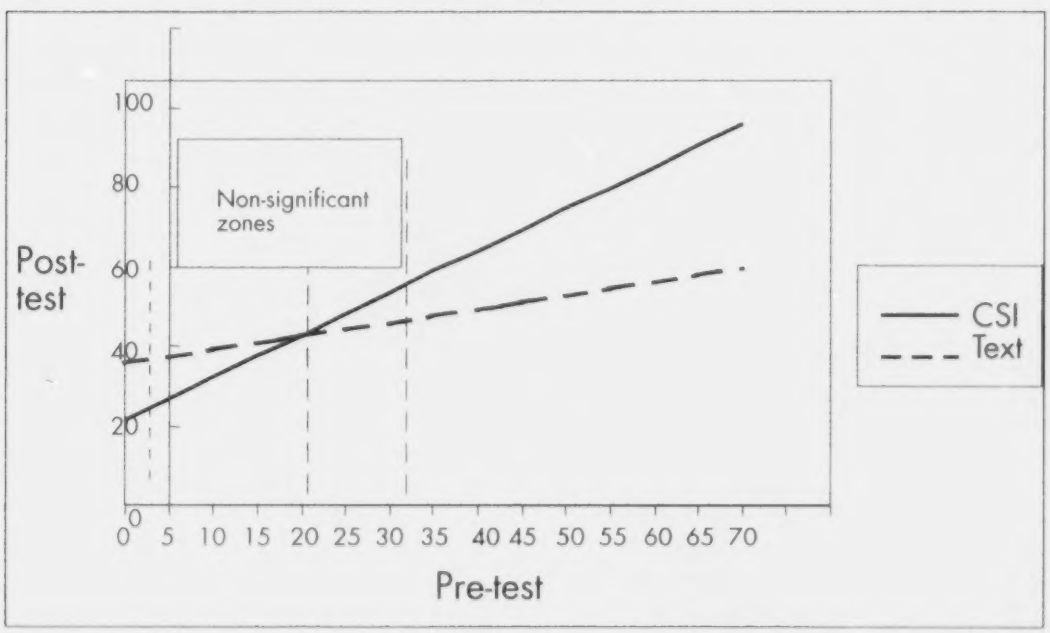

Fig. 1 Johnson-Neyman Analysis of Resultant Data

The critical values are calculated according to the following equations:

$$X_0 = \frac{a_{w2} - a_{w1}}{b_{w1} - b_{w2}} \qquad X_D = \frac{B \pm \sqrt{B^2 - AC}}{A}$$

$$A = \frac{t_1^2\alpha}{n_1 + n_2 - 4}\left(SS'_{w(Y_1)} + SS'_{w(Y_2)}\right) + \frac{1}{SS_{w(X_2)}} + \frac{1}{SS_{w(X_2)}} + (b_{w1} - b_{w2})^2$$

$$B = \frac{t_1^2\alpha}{n_1 + n_2 - 4}\left(SS'_{w(Y_1)} + SS'_{w(Y_2)}\right) + \frac{\bar{X}_1}{SS_{w(X_2)}} + \frac{\bar{X}_1}{SS_{w(X_2)}} + (a_{w1} - b_{w2})(b_{w1} - b_{w2})$$

$$C = \frac{t_1^2\alpha}{n_1 + n_2 - 4}\left(SS'_{w(Y_1)} + SS'_{w(Y_2)}\right)\left(\frac{n_1+n_2}{n_1 n_2} + \frac{\bar{X}_1^2}{SS_{w(X_2)}} + \frac{\bar{X}_2^2}{SS_{w(X_2)}}\right) + (a_{w1} - a_{w2})^2$$

2. Discussions

The statistical analysis shown above indicated that

(1) the distribution of both pre-test and post-test scores were positively skewed which implied more student efforts or instruction time needed;
(2) both F-ratios of pre-tests and post-tests were greater than table values, thus suggesting the application of a posterior comparison;
(3) in terms of homogeneity analysis, the within-group regression coefficients for experimental and control groups were 1.06 and 0.34 with intersects at 0.849 and 28.132 respectively which indicated that the CSI approach appeared to have higher correlation;
(4) the within-group regression lines intersected at 19.406 for pre-test and post-test suggesting that neither the CSI nor traditional small-group instruction approach made any significant difference for those students with pre-test scores at around 20;
(5) in the Johnson-Neyman analysis, the two values of XD revealed that the CSI approach will be of more benefit to students with pretest scores higher than 28, and the traditional small-group approach will be more suitable for students with very low pretest scores;
(6) in terms of efficacy, CSI appeared to be higher (hypothetically it would be able to benefit about two-thirds of students in this case) than the traditional small-group approach (which would benefit only a very small portion of sample students); and

(7) an extra benefit of this study was that students could simulate the operation of the old HCFC-based refrigerant systems without handling the real thing.

IV. Conclusion and Suggestions

1. Conclusion

Computer simulation applied in educational settings is not a new idea but an irrevocable trend. More and more software packages are of individualized format. They are usually more comprehensive, time saving and self-paced, which is beneficial for students with a certain level of entry skills, especially the computer literate.

However, complaints have been heard from students who are extensive computer users regarding sore eyes, stiff wrists, and even other illness associated with lack of body movements. The confinement of gazing at a cathode ray tube also contributes to drawbacks of student interest. Fortunately, the recent hardware/software development has eased the problem by user-friendly design and multi-tasking capability.

The traditional small-group approach is not new either. Pam Tyrrel (1997), a teacher at Jefferson Montessori Campus, Dayton, Ohio, USA, reported that the traditional small-group approach is working as evidenced by low absenteeism of the students, high levels of enthusiasm, long periods of uninterrupted work time, and rising test scores on proficiency tests. Nevertheless, it takes careful planning and gradual implementation.

Effective learning outcomes result from the quality of instruction. Computers help implement the delivery of knowledge and/or skills, but never will they substitute teachers. To improve the quality of instruction, instructional designers should try to match instructional approaches with students' ability.

2. Suggestions

Based on the results of the study, several suggestions on traditional small-group and CSI approaches can be made:

(1) For students who are new to a course or computers, the traditional small-group approach is useful in cases where computers or software are not available or appropriate.
(2) It is beneficial for all students to incorporate computer simulation and other traditional approaches to maximize the learning outcomes.
(3) Students, as well as teachers, should try to gain computer competence as early as possible.
(4) Further large-scale research should be conducted to verify related factors.

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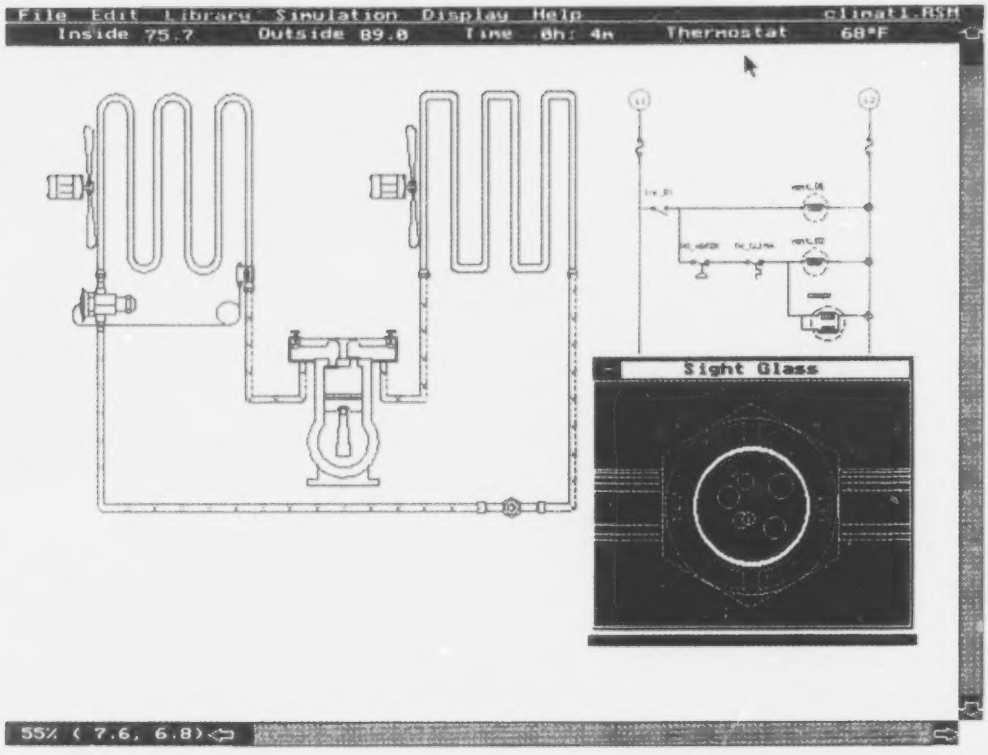
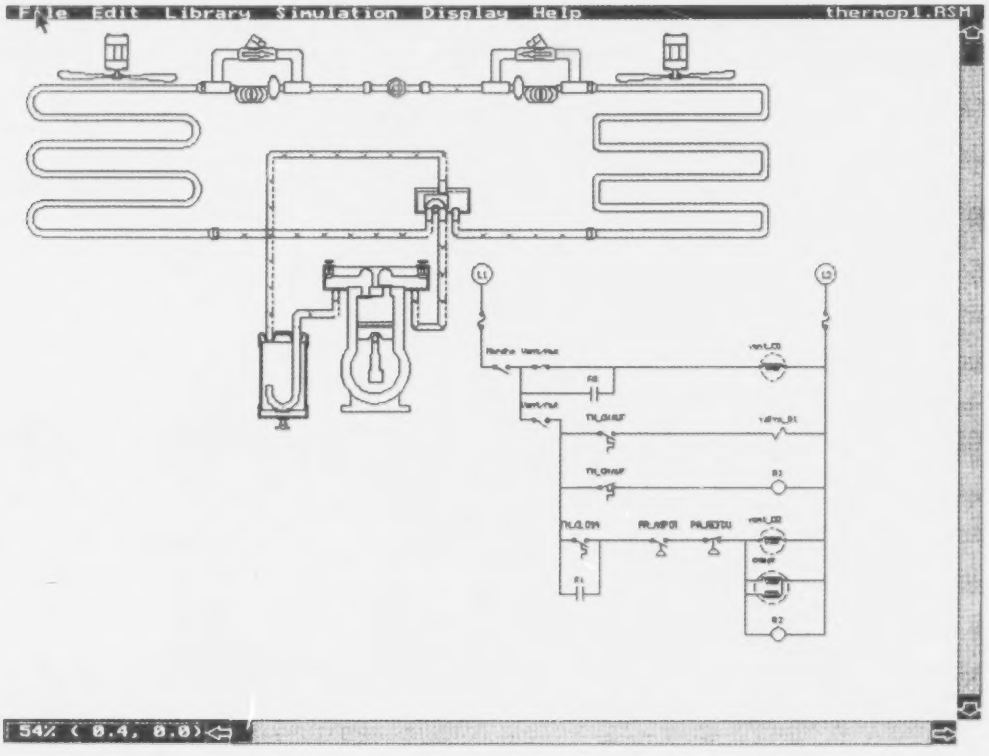
Appendix 1. Sample Software Images





MODEL OF PRE-SERVICE AND IN-SERVICE TEACHER EDUCATION FOR THE TWENTIETH CENTURY. AN INDONESIAN NEXUS

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MODEL OF PRE-SERVICE AND IN-SERVICE TEACHER EDUCATION FOR THE TWENTIETH CENTURY. AN INDONESIAN NEXUS *)

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ABSTRACT

There is a resurgent need for a change in the model for training and educating teachers that is robust to challenges of the 21st. century. The era of information and globalization is marked with rapid economic growth and swift advancement of science and technology. Global free trade is forthcoming, and accordingly, an alternative model for training and educating teachers is obligatory.

The national education system of Indonesia caters mainly for the five loci of problems, namely: education quality, relevance, equity, efficiency and effectiveness. Therefore, the system of teacher education must be (1) within the enclave of the national development, (2) bridging the real demand of the society, (3) analytic and anticipatory to the future needs, (4) appreciative to real-life situations, (5) potential for the development of the whole beings, and finally, (6) possessing distinct self identity.

The future model for teacher education should be characteristically flexible to the local, regional, national and international demands. The system of education is therefore to be linked and matched with the future demands of the era.

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A. BACKGROUND

Over the last 25 years, Indonesia has focused on increasing access to education opportunities. As a result, from 1969 to 1994 the participation rates in junior secondary education increased by 15 percent, and in senior secondary education from 9 percent to 34 percent. Currently, about 28,600 secondary schools enrol about 11,3 million students, 56 percent boys and 44 percent girls (Sommerset,1992). Most of the junior secondary schools offer specialised curricula in home economics and in vocational-technical education. Private schools enrol about one-third of all junior secondary students attend Islamic schools (van de Berg,1994).

The Sixth Five-Year Development Plan of 1994-1999 stipulates the following education strategies: (1) improving access and equity to education for every person (2) strengthening linkages among educational inputs, processes, and products to ensure relevance and quality; and (3) budgeting more efficiently and making greater use of trained staff (Wardiman Djojonegoro,1995). In pursuit of those strategies, the Government has begun to implement a compulsory nine years of basic education (i.e., six years of primary education and three years of junior secondary education as well as programs to improve the quality of education. In addition to expanding enrolments in existing schools, education would be delivered to difficult-to-reach areas through innovative means. This includes organising small schools in remote locations with fewer teachers but flexible teaching assignments and transmitting secondary education lessons to working people in widely dispersed locations through the various media of distance education. The coverage of secondary education, especially at the junior level, is expected to expand significantly as a result. Qualified teachers will be in demand to train the new generation of better skilled workers needed by the rapidly growing economy.

In quantitative terms, the teacher training system has the capacity to produce the school teachers to meet the needs of the expansion. However, the present system as a whole suffers from inefficiency, and the individual teacher education institutions suffers from quality deficiencies. A new but more promising model of teacher education to improve teacher education systems would have significant benefits. First, the new model of teacher education would improve the efficiency of the teacher education institutions by upgrading the program content, qualifications and effectiveness of staff, facilities, and linkages with the schools they serve. Second, the new model would be robust to cost effectiveness, as it would utilise the available resources efficiently. Third,

the model is flexible, as it would use more efficiently the teachers to teach different grade levels (multi-grade education), different subjects (multi-subject education), and to facilitate to getting non-teaching jobs (external flexibility).

B. THE EXISTING TEACHER EDUCATION SYSTEM IN INDONESIA

There are three types of public Teacher Education Institutions: the institute with education and other faculty departments, the institute with education faculty departments only, and the education faculty affiliated with a university. The institutions vary by ownership (public, private), size, location, quality, and other characteristics. The 31 public teacher education institutions, consist of 10 teacher education institutions located in urban centres and 19 teacher education institutions located in rural centres. Together these public institutions produced approximately 20,000 teachers in 1994 and are the largest providers of secondary school teachers. The public teacher education institutions are superior to their private counterparts in facilities, funding and public perception. The 211 private teacher education institutions are of uneven quality and produced 24,000 graduates in 1994. Their graduates compete with the public teacher education institutions for teaching positions.

Teacher education institutions are considered an integral part of a higher education system which itself is changing. A newly created Higher Education Commission is addressing key issues such as low staff motivation and morale, inefficient utilisation of existing resources, and systemic rigidity. Four elements would constitute the cornerstones of the emerging reforms: (1) institutional autonomy, (2) accountability, (3) accreditation, and, (4) evaluation.

The Government of Indonesia has made several important changes in teacher education policies in recent years. In 1989 a policy was established requiring all new primary school teachers to be trained at the two-year postsecondary school level instead of the upper secondary level as before. The World Bank is currently assisting the implementation of this policy through the Primary Teacher development Project. The policy requires all practising primary school teachers to be upgraded to the two-year postsecondary level through distance or face-to-face education. In addition the Directorate General of Higher Education (DGHE) has phased out all diploma courses for the pre-service education of secondary school teachers, so all new teachers at that level now need to have a bachelor's degree. Practising lower secondary school teachers are now being officially upgraded to a three-year postsecondary diploma at the Government's expense.

C. MAJOR ISSUES IN TEACHER EDUCATION IN INDONESIA

1. Efficiency Issues

Overstaffing at pre-service teacher education institutions. Although the Government of Indonesia has embarked on an "zero growth policy" in the public sector, the education sector has been spared, and 25,000 teaching positions were approved for 1996, including 8,000 new positions. The Directorate General of Higher Education (DGHE) has generally maintained zero growth in pre-service teacher education institution staffing, cancelling programs of study where enrolments no longer warrant their existence. Nonetheless, certain public pre-service teacher education institutions are over-staffed. When study programs have been eliminated for lack of student demand, the resulting excess teaching staff are kept on the payroll to share teaching loads with others or to do other academic work. This resulted in a low student-teacher average ratio of 9.9 : 1 for public pre-service teacher education institutions.

Limited access to in-service training. The upgrading of teachers to bachelor's level through various in-service training programs, including those offered by the Open University, is in need of support. During the period of rapid expansion of secondary education in the 1970s and 1980s, diploma programs and crash courses were opened by the junior secondary and more than half of the senior secondary school teachers today has a bachelor's degree. While pre-service teacher education institutions have been commissioned since 1992 to provide three-year post secondary diploma (D-III) upgrading courses for junior secondary teachers, less is being done for the upgrading of teacher qualification from a three-year secondary diploma to a bachelor's degree. Various universities are now offering extension courses to allow for bachelor's degree holders upgrading. Since these programs require fees and are campus-based teachers who work in outlying areas or who cannot afford the fees are unable to participate. In addition, many of the self-instructional modules for the upgrading programs were produced quickly and not field-tested, so there are doubts about quality and effectiveness. By this standard, a fair sized in-service program will be required to upgrade these teachers under he new standards in order not to lose the investments already made on these individuals.

2. Institutional Quality issues

Underqualified faculty. Pre-service teacher education institutions faculty qualifications are generally low. To meet the demands for teaching staff in the late 1970s and early 1980s, these teacher education institutions recruited new

faculty members directly from their own graduating classes with a bachelor's degree. As a result, only 23 percent of these institutions teaching staff have a master's degree or a doctorate degree, and many lecturers have no classroom teaching experience in secondary schools.

The teacher educators themselves need help to improve their subject-specific pedagogical knowledge and skills. Under the current pre-service teacher education institutions curriculum, the subject-education courses are too general and do not sufficiently address the question of how to teach specific concepts and skills, and how to assess and provide feedback to students. The links among teacher education institutions are weak, and the links with international teacher education institutions are few.

Rigid pre-service curriculum. The bachelor's degree courses curriculum needs improvement in scope, quality, and relevance to local teaching situations, especially at the junior secondary level. Through the Basic Science team composed of educators from the Bandung Institute of technology and IKIP Bandung, efforts began in 1989 to strengthen subject matter content courses in mathematics and science teacher education programs. Similar efforts are needed for the other subject areas. Furthermore in some teacher education institution's students graduate with a major in the one subject content area that they would teach in school; however, those junior secondary schools with small enrolments need teachers who can teach more than one subject (horizontal flexibility). In 1992, some teacher education institutions have begun experimenting with a curriculum that would allow the graduates to teach at both junior secondary and senior secondary schools (vertical flexibility), an initiative that needs support.

Facilities not up to standard. Equipment for the teaching of mathematics and science subjects are inadequate. Measured against the minimum standard for equipment set by the Basic Science Team for teaching the mathematics and science curricula, there is a wide variation among the institutions in the supply and quality of equipment as well as storage facilities, maintenance capacity, and general condition of laboratories. Because training and guidance are inadequate, the available equipment is often under-utilised and inadequately maintained.

Reference and other library books at the teacher education institutions are out of date. Many of the titles purchased are at least five years old. Teacher educators do not have access to the textbooks, teachers' manuals, and curriculum guides currently used.

Faculty offices are crowded or lacking altogether. In many teacher education institutions, as many as 20 lecturers share a single room. There is insufficient space to provide them with their own desks where they can prepare their lessons or counsel their students. There is rarely any space available for staff meetings or for group discussions with students. Such conditions work against instilling professionalism among faculty, collegiality, and commitment to their home institution.

Teacher education institutions uninformed of their "market". Research on effective schools show the importance of a supportive and co-operative relationship between the teacher training institution and the schools it serves. Currently, Indonesian teacher education programs do not emphasise exchanges between schools and teacher education institutions.

Inadequate preparation of teacher candidates. The higher education entrance examination scores indicate that a great number of the teacher education institutions recruits have not mastered the secondary school course content. It is well established that the entry-level characteristics of the students are critical to their future learning. Teacher education institutions, however, rarely develop an understanding of the entry characteristics of their students. In turn, many graduates are deficient in their subject content competency. In order to improve the quality of the graduates, it is necessary that the new students' performance be assessed and that guidance and training on learning strategies and study habits be provided.

Career information systems need to be developed. Up to the mid-1980s, nearly all of those who qualified in a secondary school teaching subject had a clear career path. Since then, the absorptive capacity of secondary schools has declined. It is difficult to attract teachers to the rural and remote areas. Teacher shortages still persist in some specialised subjects in provinces where the local teacher education institutions do not rum an appropriate training program, and new recruits come from elsewhere. But in most of the subject areas, teaching positions are filled. The appointments of public school teachers are processed centrally in Jakarta. Since they are not regularly linked to the MEOC in the Province, most of the graduates do not have timely information on employment, cannot provide employment counselling to their students, and do not follow up on the placement of their graduates.

Weak educational research. Pre-service teacher education institutions lecturers undertake research mainly to upgrade their qualifications or to gain credit points for promotion. In many institutions, little of this research relates to

secondary schools. This is also because teachers themselves are seldom exposed to classroom research and have rarely thought about themselves as researchers.

Research to improve instruction is needed. In addition to a well-functioning assessment system for diagnosing the characteristics of the new students entering teacher education institutions, these institutions should promote studies related to improving classroom teaching.

Sharing of experiences and scholarly exchanges is limited. Many teacher education institutions publish a journal with articles from their own teaching staff, but these do not receive wide circulation outside the institution. Establishing a national journal on teacher education, particularly with a focus on teaching techniques and research on schools, would reach a wider audience and would serve as a form for issues in Indonesian teacher education.

Inadequate accreditation system. Currently there is no external validation of the exit quality of graduates of public teacher education institutions or of the program offered. Courses of study and their corresponding tests are designed, and administered, by the lecturers themselves.

D. A CALL FOR A NEW TEACHER EDUCATION SYSTEM IN INDONESIA

1. Rationale

There is a resurgent need for a change in the model for training and educating teachers that is robust to challenges of the 21st. century. The era of information and globalization is marked with rapid economic growth and swift advancement of science and technology. Global free trade is forthcoming and accordingly, an alternative model for training and educating teachers is obligatory.

The national education system of Indonesia caters for the five loci of problems, namely: *education quality, relevance, equity, efficiency and effectiveness*. Therefore, the system of teacher education must be (1) within the enclave of the national development, (2) bridging the real demand of the society, (3) analytic and anticipatory to the future, (4) applicative to real-life situations, (5) potential for the development of the whole beings, and finally, (6) possessing distinct self-identity. The future model for teacher education should be sensitive to the local, regional, national and international demands. The system of education is therefore to be 'linked and matched' with future demands.

2. Multi-Grade and Multi-Subject Teacher Education (Vertical and Horizontal Flexibility)

Rationale. The concept of applying vertical and horizontal flexibilities to a particular teacher education system in Indonesia is central to responding to the core problem arising out of rigid pre-service curriculum. Therefore, the bachelor's degree courses curriculum needs improvement in scope, quality, and relevance to local teaching situations. Teacher education institution's graduates with a major in the one subject content area would be also able to teach the related subject content areas in schools, where a shortage of teachers is eminent. Schools with small enrolments need teachers who can teach more than one subject (horizontal flexibility). This system of teacher education is to train school teachers who are prepared for a multi-grade teaching program. A similar model may be developed within the teacher education institutions that allow their graduates to teach at both junior secondary and senior secondary schools (vertical flexibility).

The Teacher's Context. The ideas of implementing flexible curriculum is central to direction, production and performance of school teachers. An understanding of curriculum flexibilities allows student teachers to explore various means of integrating the elements of subject content areas and subject specific pedagogy.

The Curriculum Context. The curriculum should provide for the expression and enhancement of teacher candidates' mastery of 'cultural forms and traditions' of all groups of learners. Moreover, the teacher candidates should shape and structure their own learning with an understanding of forms, styles and traditions of learning of all types of learners (either that be students from different grades, or different school levels).

3. Multi-Profession Teacher Education

Rationale. Up to the mid-1980s, nearly all of those who qualified in a school teaching subject had a clear career path. Since then, the absorptive capacity of schools has declined. It is difficult to attract teachers to the rural and remote areas. Teacher shortages still persist in some specialised subjects in provinces where the local teacher education institutions do not run an appropriate training program, and new recruits come from elsewhere. But in most of the subject areas, teaching positions are filled.

The Teacher's Context. The ideas of implementing externally flexible curriculum is central to deployment of new teachers. An understanding of

curriculum with external flexibility allows student teachers to explore various means of seeking various types of jobs and professions outside the teaching positions.

The Curriculum Context. The curriculum should provide for the expression and enhancement of teacher candidates' varied expertise of different sorts of related non-teaching positions. Moreover, the teacher candidates should orient, shape and structure their own future jobs with an understanding of forms, types and traditions of jobs available in the market places.

4. The Global Teacher Education

Rationale. The era of information and globalization is marked with rapid economic growth and swift advancement of science and technology. Global free trade is forthcoming.

The Teacher's Context. The challenges of the 21 st. century bring about impacts to education of teachers. Teachers should be trained as such to cope with the issues and problems of the whole world.

The Curriculum Context. The global curriculum for educating future teachers should design and implement an international approach to the teaching of the world. The programs have to develop a range of materials that have access to the world and texts for areas of global learning, studies of societies, environment and the arts of peoples throughout the world. Through participation in the program, teacher candidates would have ample opportunities to learn more about the world (Fitzgerald,1991). Schools work towards enriching curriculum by shifting the focus of learning to acknowledge the strategic, economic and cultural significance of the world to Indonesia.

The curriculum should also develop partnerships between teacher education institutions and schools they serve as well as to develop innovative and supportive means of partnerships to relevant organisations.

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PRECONDITIONS FOR DELIVERING IN-SERVICE TEACHER TRAINING: A PERSPECTIVE FROM BANGLADESH

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ABSTRACT

This paper is directed primarily at senior administrators, deans, directors of information services and directors of in-service training programs at universities in developing countries. These are the people who must insure that in-service teacher training programs that capitalize on recent advances in information and communication technology can be delivered effectively to their faculty members.

Such programs are difficult to operate successfully almost everywhere, but may be especially troublesome in some developing countries. Many reasons are obvious, including poverty and political instability, while others are less obvious but equally challenging, including unreliable electricity and telephone services, defective security, ineffective management structures, various cultural constraints, corruption, and more fondness for machines than for people. Problems such as these are not unique to the developing world, but in countries such as Bangladesh, each is quite severe, all occur at the same time, and they often interact in the extreme.

This paper is based on an analysis of the successes and failures in a systematic one-year program to lay foundations for a technology-intensive teacher training program at a wealthy, new private university in Dhaka. It focuses on designing an in-service training program structure, getting the existing technology in working order, developing basic programs and services with available resources, developing comprehensive plans for obtaining the people and equipment needed for more sophisticated programs in the future, and dealing with basic day-to-day IT problems that do not derive from the technology but instead result from strongly held attitudes and values of the faculty and staff.

Introduction

When your institution designates or hires someone to serve as IT director, part of that person's job must be to facilitate the delivery of in-service teacher training that capitalizes on recent advances in information and communication technology. In order for IT directors to do that part of their jobs well, they must work within a system that has a specific physical and conceptual structure, they must deal with a series of historical processes within that system, and they must cope with the functioning (and malfunctioning) of various components of the system. This paper is organized around these three concepts.

The views I express here have been shaped by my intellectual background as an American, my training as a cultural anthropologist, my professional commitment to teaching, and my experiences as an IT manager in Asia and the United States. I view IT-based teacher training as directed culture change and focus here on cultural rather than technical issues.

My remarks in this paper refer to IT-based culture change at North South University (NSU) in Dhaka, Bangladesh, a five year old private university with 1500 students in one of the world's poorest countries, where I worked as IT Director for a year. Often I shall compare NSU with United Arab Emirates University (UAEU) in Al Ain, UAE, a twenty-three year old public university with 13,000 students in one of the world's richest countries, where I worked as an IT manager for three years. Although these universities differ in an astonishing number of ways, they display similar problems with regard to the management of IT-based in-service teacher training.

The Structure: A Three Dimensional Space

With regard to the in-service training component of their jobs, IT directors must:

- be responsible for their technology
- understand the kinds of training they are expected to support
- understand the level of support required to deliver each kind of training.

What IT Encompasses. To some people, "Information Technology" (IT) is just a funny way of saying "computers", but in the field of education alone, the concept covers much more than that as we enter the 21st century. IT includes but is not limited to:

- computers, local area networks, servers, printers, CD-ROM drives, and additional specialized hardware

- software and data used for both educational and administrative purposes
- Internet facilities used to obtain information from, and provide information to, servers scattered around the world
- automated libraries that access, store and distribute information in electronic and hard copy formats
- telephones, fax machines, PABX systems and the telephone lines that humans and computer systems use to communicate with the outside world
- video, multimedia, overhead and slide projectors, TV equipment and satellite receiver systems, tape recorders, slides, films, audio and videotapes, and so on, all of which used to be kept in Audiovisual Departments
- laboratories for creating multimedia course materials, and training laboratories, smart classrooms and language laboratories for using those and other IT materials for instructional purposes
- video-conferencing facilities

Underlying the Information Technology itself is the infrastructure that is required to make it work properly, including but not limited to:

- internal and external electrical power distribution systems
- internal and external telephone cabling
- environmental control systems
- security systems to protect from fire, theft, computer viruses, system failures, hostile users, etc.
- the external social network of IT vendors, Internet and telephone service providers, and others, upon whom the institution depends for its functioning in the outside world.

Then there are the people and organizations within the institution who work behind the scenes to make the Information Technology work properly and serve useful purposes, including the following:

- IT director and library director - provide vision, guidance and management for IT
- professional staff - install, maintain and upgrade the technology; provide training for faculty who use the IT

- support staff - provide basic user services at the library, in the labs, etc.

When I refer to Information Technology in this paper, I refer implicitly to all of these items, and I assume that IT directors can support all items that are available in their institutions.

Types of IT-based teacher training programs. Just as IT encompasses a diversity of technical items, IT-based teacher training is equally broad. IT directors must know which types of training are required for they place different demands on the technology and the staff. Here I outline only four major types so the range of alternatives is clear without being overwhelming.

- technical training - in-service training that enables your faculty to use the technology itself ; e.g., teaching them how to use a slide projector, a word processor, an email system, or a new PABX system, focusing on which keys to press to make the technology do whatever it does.

- content training - in-service training that uses IT to improve the faculty's understanding of their own subject matter; e.g., using distance learning technology (diskettes, CD-ROM, or the Internet) to enable a teacher to complete her MA degree in economics from a university in the UK, or to receive certification as a network administrator from Novell.

- pedagogical training - in-service training that enables your faculty to use IT to teach their own classes; e.g., teaching them how to design, produce and employ IT-based course materials that effectively utilize the university's computer labs, language labs and smart classrooms to teach English to Arabic-speaking students.

- research training - in-service training that enables your faculty to formulate research questions effectively so they can use IT independently to pursue their own in-service training; e.g., teaching them how to design key word and directory searches on the Internet or on databases such as Medline to find resources that will enhance their knowledge and skills in botany or brain surgery.

These possibilities do not exhaust all the options and to some extent they overlap with each other, but they indicate that IT -based teacher training is a multifaceted thing, and that no single person will have all - or even most - of the skills required to develop a meaningful in-service teacher training program that encompasses all of these kinds of IT training. In theory, all types should be offered in a mix that accurately reflects the needs of the institution. In fact, institutions commonly provide unsystematic coverage of the entire range of

options depending upon factors such as faculty demands, staff skills and software availability.

Levels of In-Service Training Support. An institution can provide many levels of support to IT-based in-service teacher training. The IT support level has major implications for most aspects of the academic programs, and has a major impact on its budget. At a minimum, levels of support include the following:

- Minimal or modest technical IT infrastructure with no in-house training capability. In this case, you may send people away to other institutions for their training, or hire or "borrow" visiting trainers and equipment from governmental organizations, NGOs, other educational institutions or businesses to provide training on-site.
- Minimal or modest technical IT infrastructure with minimal in-house training capability. In this case, you may provide informal and unsystematic in-house technical training by people who know the technology but have little or no experience as trainers and no knowledge of the educational enterprise, and obtain content, pedagogical and research training, if any, from outside sources.
- Modest to extensive IT infrastructure with modest training capability. Here you might hire a technical trainer to deliver systematic technical training for the entire faculty and staff, maybe with part-time help from some technically skilled colleagues, and hope that the trainer knows something about the educational enterprise, and provide informal and unsystematic in-house training in content, pedagogical and research topics by faculty members who may be skilled in their own disciplines but typically have little or no experience and skills with IT.
- Modest to extensive IT infrastructure with sophisticated training capability. In this case, you will hire or develop a professional in-house training staff that is fully skilled in all of the major areas in which training is required, including professional technical trainers, professional educational technologists, and master teachers in various fields who understand IT and its applications to the classroom and to other kinds of instruction.

The technology itself, the types of training to deliver, and the level of support to provide define the "space" within which the IT director must work to facilitate the delivery of in-service teacher training programs. Failing to agree upon the definition of this complex "space" makes it difficult or impossible for the IT director to do his or her part to support IT-based in-service training programs.

In my position at North South University, attempts to lay the foundation for an IT-based teacher training program were seriously hampered by a failure of the faculty and the administration to agree on the definition of this structure. Some members of the faculty were eager for in-service training in almost every area, but the administration were adamant in refusing to provide the technology and staff required to do the job because of other financial commitments that they considered to be of greater importance. At UAE University, we struggled for two years to establish a highly successful basic technical training program in the Computer Center, with content, pedagogical and research training beginning to follow in its wake, only to have the training program dissolve shortly after we left because of political problems that had nothing to do with either technology or training.

Ordinarily, technology is stronger than training, technical training is stronger than content and research training, and pedagogical training is the weakest of the lot.

One reason why training lags behind technology is the advertising of "user friendly" computers that has convinced decision makers that any idiot can sit in front of a computer for a few minutes and learn to use it intuitively, which of course simply is a falsehood spread by computer and software manufacturers who grossly exaggerate in order to sell more products. Another reason is that administrators who do not understand the high rate of change in IT may oppose faculty training on the grounds that faculty members were fully trained before they were hired, an especially serious problem in cultures where professors really are viewed as "experts" who are supposed to know everything about everything in their fields. The result may be a penny-wise-and-pound-foolish attitude wherein training is seen as an area in which the institution can save money. The low level of support for in-service technical training that follows constitutes one of the greatest problems IT directors face if they really are concerned about delivering services to their clients.

Providing adequate levels of support for pedagogical training is especially problematic because it may force teachers to radically re-think their jobs and their courses. An administrator or a department head cannot simply impose new technology onto old courses. The technology itself plays a major role in shaping the teaching and learning processes, and incorporating new technology often provides an incentive - and an unavoidable demand - for redesigning individual courses and the curriculum as a whole. In other words, pedagogical training is more than learning to use the technology and cannot

be viewed as an end in itself. Rather it can be the first in a long series of possibly painful steps toward enhancing the entire educational process in your institution.

Training may be expensive, but the absence of training results in wasting scarce resources and that is much more expensive. The bottom line is that administrators at the very highest levels must understand and support the structure of the IT-based in-service teacher training program or the entire educational enterprise will suffer.

The Process: Past, Present, Future

As IT managers begin to lay foundations for IT-based in-service teacher training programs, they must work through a historical process that has several major steps and a lot of minor ones. Here I am concerned only with the major ones.

Initial Conditions. When I arrived at NSU shortly after its fourth birthday, the university had 90 computers and about 15 printers, a student network and one student computer training laboratory, an administrative network, an email system, a small PABX system, an accounting system that would not perform several of the operations required of it, a rudimentary student information system, and a number of other assets all of which together constituted the diffuse beginnings of a university information system. Those assets "belonged to" the Computer Science Department, and various members of that department had served as part-time managers of the computer facilities in previous years.

Dealing with the past. Upon becoming Director of Information Services, my first job was to establish managerial control over the hardware, software, networks and staff that had, to a large extent, developed during a long period of benign neglect. Work that fell into this category included, but definitely was not limited to, things such as:

- paying for a good many pieces of hardware that NSU had "borrowed" but had not purchased from vendors who were pounding on our door and demanding their money.
- obtaining spare parts and repairing approximately 25% of the hardware that were broken and inoperative when I arrived.
- creating a Help Desk, making it into a highly visible part of Information Services, encouraging everyone to notify us of problems whenever they

occurred, and encouraging the staff to respond immediately and professionally when they were asked to help people solve their computer and network problems. We received and resolved 702 Help Desk calls between 1/11/96 and 31/08/97.

Correcting these large problems was essential, almost on an emergency basis, to turn the Information Services Department into a viable entity. Assuming that a system can handle only a limited amount of abuse before it breaks down, I think it is safe to say that this system was near the breaking point, and pulling back from it had to receive the highest priority.

Dealing with the present. Here we did a number of major jobs that had been in an early stage of conceptualization or preparation before I arrived or were obvious things to do as soon as possible, that used available resources or resources that were easy to obtain quickly, but that were not yet "in motion". Work that fell into this category included, but definitely was not limited to, things such as:

- putting the administrative and email servers into full-time operation on nights and weekends, except when power failures disable them
- renovating a floor of our office building to increase the number of labs from 1 to 5, providing better space for offices, servers and maintenance facilities, and putting all cables into channels that made the wiring much safer and more attractive
- removing all 386-model computers from offices and reassigning them to the Computer Science programming lab
- distributing all 486-model computers to faculty and administrative offices
- purchasing new Pentium computers for the new general purpose training labs
- upgrading and standardizing all software
- replacing old administrative and training servers with new ones
- obtaining and installing a new PABX system
- upgrading all theft and fire security systems
- developing technology and procedures to cope with frequent power outages
- establishing regular software and data backup procedures and schedules

- installing anti-virus software to protect all computers
- providing entry level Internet access via a dial-in connection with a commercial Internet service provider

As we completed the items in this list, Information Services became increasingly capable of supporting in-service teacher training, which it certainly had not been able to do earlier in its history. However, the department still lacked some basic items required to do that job, the most conspicuous of which were:

- No data projector to use for IT-based classroom instruction of faculty or students
- No professional technical trainer to develop, manage and deliver a technical training program that would enable the faculty to use the technology that was available to them
- No faculty expertise to provide content, pedagogical or research training based on the improved technology so the faculty could put the technology to work as part of their teaching and learning activities

Consequently, the technology was developing nicely but faculty use of it remained quite primitive.

Dealing with the future. Here we put a great deal of effort into developing concrete plans for 1998 and beyond. This included articulating a vision for the future (NSU as one of the 50 best universities in Asia by 2010) and developing a basic set of project plans so that the university could begin to work toward that vision in a systematic and coherent fashion. The process yielded budgeted proposals for buying new technology, developing new programs and hiring new staff. The result was a long range plan that should serve the university well into the 21st century. The following lists a few key items in the plan that pertain directly to in-service training:

- place a networked computer on the desk of every full time faculty member so everyone has an incentive to learn to use IT
- establish an electronic library to provide everyone with easy access to materials that are available today on the Internet, CD-ROMs, and other media, and teach people to use it
- establish a comprehensive technical training program so that all faculty, staff and students who have access to the technology know how to use it

effectively

- hire faculty members who have the content, pedagogical and research training skills needed to deliver in-service teacher training in their areas of expertise
- hire a Director of Information Services and a Director of Libraries who can help to create one of the best universities in Asia.
- hire adequate professional technical staff and technical support staff to install, maintain and operate the IT and to train the users

If this plan, or something like it, is followed, the university will be able to provide an effective IT-based in-service teacher training program by the turn of the century. The job will be both difficult and expensive, but if the university is serious about becoming an important educational institution in the next century, it must find the resources and use them well.

Functions and Malfunctions

In order to establish an IT-based in-service training structure and go through the process required to make it truly effective, the IT director must deal with a broad range of day-to-day problems that do not have any IT content at all, but all of them must be solved if the enterprise is to succeed. It is in this area that my background as an American anthropologist, manager and professor comes through most clearly.

Cultural contexts. An academic IT director should be responsible for making the technology work at his university. For a Western IT director in a Western context where his superiors, colleagues and staff generally share his attitudes and values, the job can be demanding, but it is essentially pretty straightforward - work with superiors, colleagues and staff to determine what needs to be done, and organize and manage the resources to get it done on time and within the budget. In a non-Western context, the same IT director has a fundamentally different job for many of his superiors, colleagues and staff probably do not share his attitudes and values; therefore, the IT manager can either do his best to perform his technical and management jobs despite the incompatible set of attitudes and values that envelop him, or he can attempt to change the attitudes and values of the people with whom he works. Either way, the likelihood of failure is high.

First I briefly outline some of the problems to which I refer, then I return to talk even more briefly about solving them.

External service providers. Here I refer to problems posed by the people

and organizations outside the university upon whom the IT manager must depend for products and services that the university cannot provide for itself.

- Ephemeral businesses that sell you a product and then go out of business just when you need support for their product.
- Undercapitalized vendors who sell you a product, but save money by refusing to train their service personnel to support it .
- Lack of spare parts in the country, which means that a hardware failure that you could repair easily in an hour may take anywhere from two weeks to two months to repair. Your faculty members then spend a lot of time without the equipment they need, or the IT Department must have a lot of spare equipment to compensate for the absence of spare parts in the country.
- A fatalistic attitude which says that hardware failures simply should be accepted, and that trying to prevent them, resolve them quickly or get vendors to honor their warranties is to some extent an affront to the nature of things.

Technical infrastructure. These problems may characterize either external providers or the university itself; however, they are separate from the information technology and may apply to all aspects of the university.

- Electrical and telephone services that operate only intermittently. Being satisfied when electricity is available 80% of the time is not good enough if you have invested heavily in technology that requires electrical power 100% of the time.
- Inadequate attention to theft, fire and other security systems. If your university cannot or will not protect its investment in IT, then it should postpone investing in the IT. It makes no sense to purchase the technology only to have it stolen or damaged by disasters that can be prevented.
- Lack of attitudes, skills, equipment and parts required to maintain the infrastructure. Often it is easy to convince the administration to buy a roomful of new computers for $1000 each, but a lot harder to convince them to buy a $25 ladder and a $5 screwdriver that the staff need to install the network cables. But if the staff cannot install, maintain and operate the hardware, what good does it do to buy it in the first place? It's a question of getting the priorities right.

Decision making and operational management structures. Here I refer to the ways in which university administrations are organized to respond to the needs of the IT Department. When a university is organized on the assumption that all initiatives will come down from above, they may be incapable of

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responding appropriately or promptly to initiatives that come up from below.

- The IT director must have control over his staff and budget to respond to changing institutional needs; e.g., policies requiring approval from the president or vice chancellor before the IT director can re-deploy his staff to handle changing workloads throughout the semester paralyze the IT director.
- Since IT is a new and rapidly developing field, policies and procedures developed years ago for managing traditional academic departments may not work today for managing the IT Department; e.g., a $10 per month petty cash limit may be adequate for departments to buy coffee and tea, but that limit makes it impossible for the IT Department to respond quickly when an essential computer breaks just before an in-service training workshop or during final exams.

Organizational planning. Here I refer to the process by which the university decides where it wants to go with its information technology.

- Since it is safe to talk but it may be risky to act, many potentially valuable ideas are talked to death in endless inconclusive meetings. Conservatism is valuable in many contexts, but too much of it, especially when it is due to ignorance or failure to trust your IT director, can kill your IT Department.
- If you do too much, you may make a mistake. Since an administrator can be fired for making a mistake but will not be fired for doing nothing at all, some feel it is best to do nothing. This attitude is absolutely incompatible with innovation and experimentation, both of which are essential if your IT Department is to flourish. If they predominate, they will paralyze the IT Department.
- Top down, behind the scenes, paternalistic micromanagement can paralyze the IT director. The IT director may provide inputs to administrative decision makers, and eventually receives outputs from those decision makers, but all too often does not have access to the process by which the administration gets from one to the other. If the IT director has little or no chance to shape decisions as they are being made, the decisions ultimately reach him like oracular statements from a black box, and his valuable knowledge and skills are wasted.

Staying on course, on schedule and within the budget. Academic programs cannot be created overnight, and they cannot be turned on and off like light bulbs. The IT director must have adequate lead time to create a program, and must have adequate operational time to debug it before deciding whether it will work. This problem manifests itself in a number of ways including:

- Failure to understand the time dependent nature of historical processes, as in expecting a complex new program to become operational in a few days rather than a few weeks or months.
- Capriciously changing plans before evaluating the implications of those changes, as in changing an examination or training schedule before consulting with the IT director who must manage the technical and staffing changes entailed by the schedule change.
- Failure of high level administrators to trust their own judgment and the judgment of their technical managers, as in requiring that virtually all IT management decisions be vetted by committees often comprised of people who know little or nothing about IT.

Corruption. This problem, like all of the others outlined here, is not unique to developing countries; nevertheless, it is a serious problem in many developing countries, and when it interacts with other problems, it can be devastating for your IT-based in-service training program. Examples include the following:

- The telephone service for your Internet connection fails frequently, but can be made to fail a lot less frequently in exchange for baksheesh to somebody who works at the telephone office. Will you pay him?
- Vendors who assume that it is perfectly all right to submit tenders for new computers, then begin telephoning the IT director the day after the tenders are opened to offer better deals to the university, plus rewards for the IT director, in exchange for awarding the contract to them.
- Convoluted purchasing policies that are designed in part to prevent blatant corruption, but are so intractable that you cannot get anything done if you comply with them, so you either stop trying to do anything, or you find ways to circumvent the policies which ultimately produces a different kind of corruption.

Cultural constraints. These problems derive from religious and social values that operate throughout the university and the society at large, and may not present serious problems in many areas outside of the IT Department. However, because of the intrinsically international, multicultural and rapidly changing nature of IT as we enter the 21st century, they can create serious problems with regard to both the content and the operation of the IT Department and its teacher training programs.

- Use of global resources may be limited by religious and political values. This is especially problematic for Internet services where "proxies" may be

used to filter out objectionable materials, and for in-service training that uses software and databases developed within different cultural traditions; e.g., American EFL materials that refer to pork and alcohol may be prohibited in Moslem universities, so Moslem universities must either censor the offending materials, create their own materials, or support outside organizations that develop culturally appropriate materials. Failure to cope with this problem can generate serious problems in teacher training programs.

- Using existing IT and developing new software require analytical and critical thinking skills, while mastering some other disciplines works best with rote memorization. Study skills that are very effective for memorization simply do not work for critical thinking tasks; however, teaching critical thinking skills in a program based on memorization is likely to be highly disruptive for teachers as well as students. In other words, critical thinking skills are necessary in the field of IT, but teaching and learning them may be politically and religiously suspect in some universities.
- Providing full access to IT services for all users may be incompatible with a rigidly hierarchical social organization, especially with regard to Internet and email access, wherein faculty members may view access to these services as privileges associated with their rank and oppose student use of the services, even though learning to use the technology should be an integral part of the students' education.

Teachers' attitudes toward planned culture change. This is one of the most difficult problems for an IT director to deal with for it lies precisely at the core of the entire in-service training process. In order to learn something new, instructors must first accept the fact that they do not know whatever it is that they must learn. But the very act of admitting that they do not know something can damage their self esteem and their standing with their peers. So how can they ever learn something new? This is not so much of a problem for people who are called "students" and by definition are expected to learn, but the problem can be nearly insurmountable for people who are called "teachers" and for that reason are expected to know everything that lies within their domain.

- Faculty members who are afraid to make mistakes or lose face as learners may refuse to participate in IT-based training, refuse to work in public training labs, and refuse to participate in public training programs.
- Faculty members who are afraid to make mistakes or lose face as teachers may refuse to teach anything that they do not know perfectly. I once had an extraordinarily rigid technical trainer working for me (very briefly) who developed course notes for a particular piece of software in 1987 and

refused to teach anything else six years later. Technical trainers who have that kind of attitude must fail in the rapidly changing world of IT.

- Senior faculty members who matured before the advent of IT often fear the technology themselves and may oppose all efforts by the institution to adopt IT and provide training in its use precisely because a young professor who learns to use the technology effectively can do a better job than an old one who refuses to use it. These people, like the Luddites of 19th century England, can sabotage all of your efforts to provide effective IT-based in-service training for the people who are willing to learn how to use it, and are prepared to modify or completely redesign their courses and their own roles as teachers in order to accommodate the new technology.

The problems described above derive from attitudes and values that may be perfectly appropriate in most of your university's programs, but can create problems for IT directors and IT-based in-service teacher training programs in some parts of the developing world. My objectives here are not to find solutions for each of these problems or to suggest that they are unique to the developing world, but rather to sensitize you to the prevalence of them and to indicate some ways in which the values and attitudes of administrators and faculty members can directly impinge on your IT director's ability to support IT-based in-service teacher training programs.

Conclusion

If the attitudes and values described in the section on Functions and Malfunctions are combined with the common reluctance of administrators to design a suitable structure for their in-service training program and to provide the equipment and staff required to support technical, content, pedagogical and research training, you can expect your IT-based educational programs to fail, for the people who need to use the technology simply will not have the skills required to do so. When that happens, your university's investment in IT has been wasted.

I urge you to shift your focus away from the technology and the delivery of specific in-service training courses, and instead to focus on the underlying attitudes and values of administrators, senior faculty, instructors and members of the professional technical staff that will make your IT-based in-service training programs succeed or fail.

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SOFTWARE SELECTION AND EVALUATION STRATEGIES FOR PRESERVICE AND INSERVICE TEACHER TRAINING PROGRAMS

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SOFTWARE SELECTION AND EVALUATION STRATEGIES FOR PRESERVICE AND INSERVICE TEACHER TRAINING PROGRAMS

Some teachers and administrators at all educational levels "suffer" from a malady called computer phobia. Certainly those afflicted are incapable of choosing software for the computer literate. Who then can choose software?

What causes computer phobia? At times, promises are made concerning the delivery of computers and due to lack of funds the delivery day never comes or is so late in coming that the computer becomes an item of such great importance that it is actually feared. Another reason for computer phobia is the thinking that the teacher or the administrator will become obsolete because of the computer!

Before the arrival of the computer, an orientation session is necessary to dispel fears by discussing and explaining all the wonderful things the computer can do to assist the teacher and/or administrator: the machine can enhance classroom learning and can make an administrator's life easier by having information recalled in seconds (in lieu of searching through files or books). The demonstrator will need to use visual aids – not the computer – for a first lesson. 'Tis most important that the demonstrator not give too much technical information or not–at this first session. Too much can confuse and cause anxiety that leads to more fear of the computer. (Watch computer jargon, too).

At a subsequent session, the computer is introduced and the demonstrator/facilitator might show how computer skills can aid administratively. At later sessions the teacher discovers how to utilize the computer in the classroom. Finally, teachers and administrators learn to work with one or more computers with children in a classroom setting. To prevent computer phobia, lectures and demonstrations are to move slowly – allowing for much discussion and input from the learners.

Once machines are being used with ease in the classroom, teachers need to stay focused and not let the children get carried away time-wise. But, of course, children are to be challenged and motivated and should be allowed to explore. They learn to surf the web to access information and then to refine that information. This necessitates writing skills; the children must write up what was discovered...

At this point teachers/administrators should have recovered, if indeed they were suffering from the malady termed computer phobia. This means there is a realization that computer skills are invaluable. Now the learner is ready to choose software!

We need to prepare the pre-service educator with the skills and knowledge to select software effectively. Today there are numerous commercial software suppliers, providing excellent, good, and unfortunately, some inferior material for use in school computers. It is important for teachers to carefully evaluate software for potential use by students. The research literature identifies three distinct phases of software evaluation: first, identify software of potential interest; second, hands-on evaluation by teachers; and third, student field-testing.

The quickest way to get a lead on products is often to look through distributors' catalogs and published reviews. The catalogs that include detailed program descriptions are most helpful. Although there are software review reports available, it is better for teachers to evaluate software according to their students' unique needs, interests, and abilities. Another method of identification is to ask colleagues about the software they find to be most effective. However, educators must remember that what works well for one person may not work well for another. Concern must be focused on promoting teaching and learning within the scope and sequence of the curriculum. The advice of colleagues is important. However, Lockhard, Abrams, and Many (1997) warn that "one of the most useful services your professional contacts can provide is to tell which products to avoid, rather than which you surely will want".

Published reviews are flourishing. Once available to a select market, the broad appeal of computer-assisted instruction has necessitated widespread distribution. In the United States of America, State Departments of Education have assembled a database of information compiled by software evaluators. These evaluations can be very helpful in identifying programs for further consideration, but are of little use when making a selection for purchase. The evaluations are not subject to specific standards and are usually not based on field-tested results.

The educator must examine the content of the program and determine whether or not the program's goals, objectives, and skills are consistent with the educational outcomes sought for the student. The publisher's assignment of a grade level does not mean that it is appropriate with older students. Use the grade level as a 'guesstimation' to determine the developmental model.

The second and third phases of software evaluation are the most reliable and useful in determining suitability for classroom instruction. With respect to hands-on evaluation, educators must insist on full access to the entire program when sampling material at a software demonstration. In some cases, a neighboring school might offer an opportunity to navigate the program alongside a colleague who has used the program.

Educators must analyze the program's instructional design (i.e. the way information is presented) for child-oriented features that are age inappropriate. Many programs use graphics or animation routines that employ child-oriented characters or actions – or auditory feedback suitable for younger children.

Educators also need to evaluate the content and theme of the program for age appropriate interest levels and functional outcomes. The activities should be at an interest level similar to that of same age peers. The theoretical or outcome orientation of the software must be functionally related to real-world, real-life situations.

Examination of the cognitive level of the software must be considered. Although a student's initial functioning level may require concrete examples and minute steps using a task-analytic approach, attempts should be made to employ high level skills for decision making, values clarification, and other thinking skills.

Student field testing is considered to be the critical component of the software evaluation process. While observing students as they navigate the program, we need to evaluate the social context of how the learner's use of the program will appear to outsiders. Software should facilitate social integration with same-age peers rather than isolation. The content must provide an environment that does not stigmatize – software that caters to immature behavior will reinforce immature behavior – and cultivate in teachers and caregivers the belief that this is expected behavior.

Several models for field testing have been developed (Reiser and Dick, 1990; Zahner et al., 1992). A simple approach offered by Lockard, Abrams, and Many (1997) includes six steps:

- Identify software to be reviewed
- Check program for suitability (curriculum and age considerations)
- Try out on students
- Measure learning immediately and after some delay (one or two weeks)
- Check student reactions to the program
- Make decision (re: purchase)

Considerations for Special Education Students

In addition to the criteria mentioned, there are many suggestions for the selection of classroom software to be used by special education teachers. According to Smith and Vokurka (1990), even though special educators receive training in selecting software, their knowledge does not automatically translate into an organized process of selection. Educators need "...an organized and systematic process for ...selection of usable software of maximum benefit to the handicapped learner." Software must be compatible with special education learner needs and characteristics. Do not select software only for its overt motivational appeal with use for students who have moderate to severe disabilities. The program should enhance independent-living, job-related, or leisure time activity skills,

It is important to consider whether or not giving the student access to an adaptive device of an additional peripheral will increase the age appropriateness of the software. Adaptive devices may make the learner more independent and the user of software more effective. Any adaptive device that normalizes the user's computer access and productivity will result in a more appropriate learning environment. Gardner and Campbell (1987) state that "applications of technology must provide opportunities for integration, personal choice, and individual dignity by providing individuals...with an instrument to demonstrate appropriate behavior and enhance perceptions of their similarities to peers...."

The Alliance For Technology Access (1996) states that there is no one best "piece of software for someone with a disability...individual needs and resources will determine...options...and choice." Vockell and Schwartz (1996) state that computer use "is not the solution to all learning problems. And we must realize that the computer is not a substitute for direct instruction by a teacher".

Summary

As we move into the 21st century, pre- and in-service teachers and administrators will be selecting software from thousands of advertised packages – without computer phobia. It is therefore crucial for these educators to have the skills necessary to make wise choices given curriculum and budgetary constraints. These software packages must meet the needs, interests, and abilities of all students with special attention focused upon those with special learning needs.

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AN INVESTIGATION OF ELECTRONIC INFORMATION ACCESS TECHNOLOGY NEEDS FOR PRE-SERVICE TEACHERS

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Ours is an information-technology oriented society. Needs, attitudes toward electronic information access technologies have therefore been of interest to researchers in the area of technology management. How to set up an electronic information access environment becomes a major concern of managing academic institutions. It is necessary to understand the needs and attitudes before any decision making process.

This research presents the results of a survey of the information needs, attitudes, and expectations of pre-service teachers in Taiwan. The study sought current views on information technology and access, library collections, cooperative collection development, and library resource sharing. The objectives were:

1. To produce a needs assessment and inventory of the technologies utilized and/or needed by pre-service teachers for effective access to electronic information products and networked resources
2. To become aware of users' perceptions of acceptable library or system performance in a resource-sharing environment and for an effective document delivery system
3. To sensitize pre-service teachers and foster their commitment to resource sharing and document delivery among
4. To achieve an awareness of pre-service teachers needs and expectations regarding access to electronic and networked information resources

5. To figure out the policy of managing information technology on pre-service teachers' academic environment

For achieving the purpose of this study, there were four stages of the whole research. The first stage was literature review. The second stage was research tool design. The third stage was survey process. The fourth stage was data analysis.

Problem of the Study

The problem of this study was to identify the needs of electronic information access technology for pre-service teachers.

Purpose of the Study

The purpose of this study was to investigate pre-service teachers' needs of electronic information access technology.

Need for the Study

The motivation for this study was the desire to provide an understanding of pre-service teachers' needs of electronic information access technology. Based on the awareness of pre-service teachers needs and expectations regarding access to electronic and networked information resources, teacher preparation institutions could figure out the policy of managing information technology on academic environment.

Questions of the Study

This research answered following questions through survey procedure:

- What is the pre-service teacher's need-degree of each electronic information access technology?
- What is the pre-service teacher's usage-frequency of each electronic information access technology?
- Where pre-service teacher could use electronic information access technology?

Procedures and Methodology of the Study

The procedures of this study were:

1. Identify a research problem.
2. Review the related literature on electronic information access technology.
3. Select, develop, and modify instrument for the study.

4. Discuss and modify survey instrument through panel discussion.
5. Perform a pilot study with a sample of eligible pre-service teachers.
6. Discuss the pilot study with the panel members and revise the instrument.
7. Mail the questionnaires to the selected sample participants.
8. Follow-up with additional questionnaires and letters in case of inadequate or non-returns of the initial mailing.
9. Collect data from the questionnaires, code and analyze the data.
10. Identify the need degree and frequency and location of electronic information access technology based on the statistical findings.
11. Write a final report, summary, conclusion, and make recommendations based on the findings.

For achieving the purpose of this study, there were four stages of the whole research. The first stage was literature review. The second stage was research tool design. The third stage was survey process. The fourth stage was data analysis.

The target population included pre-service teachers of three normal universities and nine teachers' college. The questionnaire method of data collection was used for this study. The instrument was structured into three parts. Part I included three fixed-response questions concerning need degree, usage frequency, and location of ten electronic information access technology. Part II queried the increasing use of the technologies of part I. Part III focussed on which types of training to use electronic information access technology were required.

In Part I, need degree were rated into five categories: Highly Unnecessary = 1, Unnecessary = 2, Neutral = 3, Necessary = 4, Highly Necessary = 5. Frequency were categorized into never, infrequently, daily, weekly, monthly. Locations were categorized into library, office, and home.

Part II and Part III contained a continuum of five possible responses used to indicate the necessity. Rating scales for each item include: Highly Unnecessary = 1, Unnecessary = 2, Neutral = 3, Necessary = 4, Highly Necessary = 5.

A Cronbach's alpha reliability was computed for each part. As presented in Table 1, the reliability ranged from 0.9241 to 0.9761.

Table 1. Reliability for sub-item and total items

Sub-item	Internal reliability
Needs of access technologies	0.9241
Increasing use of electronic information access technology	0.9761
Learning types	0.9630
Total	0.9748

Statistical Hypotheses

Hypothesis 1

H_o: The degree of necessity of using each electronic information access technology is equal or less than 3, neutral.

H_a: The degree of necessity of using each electronic information access technology is larger than 3.

Hypothesis 2

H_o: The degree of necessity of the statement for increasing use of electronic information access technology is equal or less than 3, neutral.

H_a: The degree of necessity of the statement for increasing use of electronic information access technology is larger than 3.

Hypothesis 3

H_o: The degree of necessity of each learning type is equal or less than 3, neutral.

H_a: The degree of necessity of each learning type is larger than 3.

General Results of Investigation

The questionnaire was mailed to colleagues in twelve teacher preparation institutions. With the assistance of those twelve colleagues, questionnaires were distributed to 3600 students. There were 3219 return questionnaire and 3015 were usable. The return rate was 89.42% and the usable rate was 93.66%.

The actual number considered for this data analysis was 3015 (83.75%).

Frequency of using information resources through electronic technologies were listed in the following table 1.

Table 1. Frequency of using information resources

Information Resource	Frequency									
	Never		Infrequently		monthly		weekly		daily	
On-line catalog system of campus library	612	20.3%	608	20.2%	611	20.3%	561	18.6%	623	20.7
On-line catalog system of other library	612	20.3%	609	20.2%	610	20.2%	571	18.9%	613	20.3%
Journal index/ abstract databases on campus library	610	20.2%	609	20.2%	610	20.2%	574	19.0%	612	20.35
Journal index /abstract databases via commercial vendor	609	20.2%	609	20.2%	612	20.3%	572	19.0%	613	20.3%
Discipline-based BBS, listserver, WWW	610	20.2%	610	20.2%	608	20.2%	575	19.1%	612	20.3%
Electronic journals and newsletters	609	20.2%	610	20.2%	645	21.4%	538	17.8%	613	20.3%
E-Mail	610	20.2%	610	20.2%	643	21.3%	538	17.8%	614	20.4%
Full Text electronic databases	609	20.2%	611	20.3%	581	19.3%	601	19.9%	613	20.3%
Statistical databases	610	20.2%	611	20.3%	572	19.0%	611	20.3%	611	20.3%
CD-ROM index/abstract databases of library	610	20.2%	610	20.2%	572	19.0%	612	20.3%	611	20.3%

The major location of using electronic technologies accessing information services were library, office/lab, and home. The frequency count of location for each service were listed in Table 2.

Table 2. Frequency count of using information resources in major location

Information Resource	**Frequency**					
	library		**office/lab**		**home**	
On-line catalog system of campus library	812	26.9%	1218	40.4%	985	32.7%
On-line catalog system of other library	1255	41.6%	890	29.5%	870	28.9%
Journal index/ abstract databases on campus library	829	27.5	935	31.0%	1251	41.5%
Journal index /abstract databases via commercial vendor	996	33.0%	1256	41.7%	763	25.3%
Discipline-based BBS, listserver, WWW	1254	41.6%	700	23.2%	1061	35.2%
Electronic journals and newsletters	635	21.1%	1126	37.3%	1254	41.6%
E-Mail	1193	39.6%	1215	40.3%	607	20.1%
Full Text electronic databases	1151	38.2%	644	21.4%	1220	40.5%
Statistical databases	711	23.6%	1255	41.6%	1049	34.8%
CD-ROM index/abstract databases of library	1255	41.6%	983	32.6%	777	25.8%

Results of Hypothesis Tests

Hypothesis 1

H_o: The degree of necessity of using electronic information access technology is equal or less than 3, neutral.

H_a: The degree of necessity of using each electronic information access technology is larger than 3.

In Table 3, it showed the result of statistical tests for each item.

Table 3. T-test, mean, and standard deviation of each information resource

Information Resource	Mean	S.D.	T	Status
On-line catalog system of campus library	3.8013	1.168	37.67	*
On-line catalog system of other library	4.1997	0.752	87.56	*
Journal index/ abstract databases on campus library	3.8219	1.147	39.33	*
Journal index /abstract databases via commercial vendor	3.8212	1.147	39.31	*
Discipline-based BBS, listserver, WWW	4.1877	0.762	85.59	*
Electronic journals and newsletters	3.8222	1.147	39.36	*
E-Mail	3.8030	1.152	38.26	*
Full Text electronic databases	3.7642	1.162	36.12	*
Statistical databases	3.7619	1.162	36.01	*
CD-ROM index/abstract databases of library	3.7536	1.174	35.24	*

* significantly higher than 3

Hypothesis 2

H_o: The degree of necessity of the statements for increasing use of electronic information access technology is equal or less than 3, neutral.

H_a: The degree of necessity of the statement for increasing use of electronic information access technology is larger than 3.

The null hypothesis was rejected at .05 level for all eight statements for increase using electronic information access technologies.

Table 4. T-test, mean, and standard deviation of each statement for increase using information resource statement

statements for increase using information resource	Mean	S.D.	T	Status
availability of computer equipment in my office/lab	4.2106	0.754	88.12	*
availability of computer equipment in my home	3.8385	1.154	39.89	*
connection to campus network	3.8332	1.156	39.59	*
access to data and text files through campus computer network	3.8381	1.252	39.86	*
more information about resources available through networks	3.8391	1.154	39.93	*
instruction/training in the use of computer equipment	3.8381	1.314	39.86	*
instruction /training in the use of e-mail, network sources, on-line databases	4.2106	0.755	88.06	*
funding	3.8385	1.155	39.87	*

* significantly higher than 3

Hypothesis 3

H_o: The degree of necessity of each learning type is equal or less than 3, neutral.

Ha: The degree of necessity of each learning type is larger than 3.

The null hypothesis was rejected at .05 level for all seven types of learning using electronic information access technologies.

Table 5. T-test, mean, and standard deviation of need degree of ways to learn using electronic information access technologies

ways to learn using electronic information access technologies	Mean	S.D.	T	Status
small group classes/workshops	4.2070	0.753	88.07	*
printed manuals	4.1983	0.749	87.89	*
formal classes	3.7847	1.160	37.14	*
one-on-one tutorials	3.7857	1.116	37.18	*
telephone assistance	3.7834	1.610	37.09	*
on-line tutorials (CAI)	3.7831	1.161	37.05	*
assistance via e-mail	3.7851	1.601	37.15	*

* significantly higher than 3 at .05 level

Conclusion

- According to the statistical test result, the priority of electronic information access technologies were grouped into two layers. In table 6, it showed both the content and priority.

Table 6. The need priority of information resource via electronic information access technology.

Information Resource	**Priority**
On-line catalog system of other library	1
Discipline-based BBS, listserver, WWW	1
Electronic journals and newsletters	2
Journal index/ abstract databases on campus library	2
Journal index /abstract databases via commercial vendor	2
E-Mail	2
On-line catalog system of campus library	2
Full Text electronic databases	2
Statistical databases	2
CD-ROM index/abstract databases of library	2

Considering the usage frequency of electronic information access technologies:

- There were around 20% pre-service teachers who never used electronic information access technologies.
- There were around 20% pre-service teachers who used electronic information access technologies daily.
- There were around 20% pre-service teachers who used electronic information access technologies monthly.
- There were lower than 20% pre-service teachers who used electronic information access technologies weekly.

From an overall point of view, electronic information access technologies were most used on campus by pre-service teachers. They used those services from the location of library and office/lab.

According to the statistical test result, the priority of increase using of electronic information access technologies were grouped into two layers. Table 7, shows both the content and priority.

Table 7. The need priority of increasing use of electronic information access technology

statements for increasing use of information resource	**Priority**
availability of computer equipment in my office/lab	1
instruction /training in the use of e-mail, network sources, on-line databases	1
more information about resources available through networks	2
availability of computer equipment in my home	2
funding	2
access to data and text files through campus computer network	2
instruction/training in the use of computer equipment	2
connection to campus network	2

According to the statistical test result, the priority of electronic information access technologies learning activities were grouped into two layers. Table 8, shows both the content and priority.

Table 8. The need priority of learning electronic information access technologies

ways to learn electronic information access technologies	**Priority**
small group classes/workshops	1
printed manuals	1
one-on-one tutorials	2
assistance via e-mail	2
formal classes	2
telephone assistance	2
on-line tutorials (CAI)	2

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Recommendations

The recommendations of this study are based on the conclusions that were presented.

1. It is recommended that electronic information access technologies are needed and should be provided according to the priority presented.
2. Based on the thinking of increasing the use of electronic information access technologies, it is recommended that computer equipment should be increased in the office/lab and instruction/training activities in the use of e-mail, network sources, on-line databases are to be increased.
3. It is recommended that small group classes and workshops teaching electronic information access technologies are to be established.
4. It is recommended that printed manuals for using electronic information technologiesare to be provided.

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Key Note address

Towards Making School Education More Effective

Dr. M.S. Gosavi

At the outset it must be made clear that there are five pillars on which the effectiveness of the educational delivery system depends. Curriculum Development, Faculty Training, Accredidation System, Linkages with the Society and Institutional Ethos are these five factors. In the present existing educational set up in our State it is a matter of highest satisfaction that at the primary & the secondary stage a new curriculum has been introduced, teacher training has been at premium and the S.S.C. and H.S.C. Boards for examination are concerned with fair and proper evaluation pattern. The Non-Government organizations therefore have an important role in making the educational delivery system more effective and qualitative by developing appropriate linkages with the Society and by building up synergic institutional ethos.

It is therefore proposed to have a concentration on the following three factors for making secondary education more effective at the level of non-government organizations/voluntary educations.

(a) Training and re-training of the staff and reorienting them for their meaningful involvement for developing ethos.

(b) Involving parents and securing their hearty co-operation for developmental activities so as to enrich the total environment for making the educational endeavor effective and rewarding.

(c) Building linkages with the society through eminent past students and well wishers in the region so as to carve out a social image for the institution foundation and to make it academically innovative and financially stable and sound.

The ultimate success in all these endeavors depends upon teachers voluntarily accepting their meaningful participation for making the entire educational process successful and the head of the institution emerging as a dynamic leader for innovation, integration and internationalizing the standards of excellence in the given existing environment.

For this purpose the commitment of the top management, the leadership and

co-ordinated interaction provided by the head of the institution, and the meaningful involvement of the faculty concerned will alone ensure and guarantee the success of any such program. This workshop is therefore the beginning of the long road on which all concerned in this process have to walk and perform their role by adopting strategies and action plans for the implementation of change and reform in the secondary and higher secondary system.

This specific purpose workshop will discuss the following five issues for achieving excellence:

(a) Development of teachers through communication skills
(b) Creating a social image through effective teaching methods
(c) Common examinations
(d) Academic planning and implementation
(e) School organization change through value based learning

It is necessary to achieve the objective on the basis of experience and experiments successfully undertaken through proper perspective. For this purpose it will be worthwhile to emphasise the following:

(1) Teachers will voluntarily agree to play their role by considering their day to day work as divine activity leading to character building of the individual pupil, responsible citizenship in the society and nation building at large and in addition to the assigned duties under the SS code which they are to perform faithfully and with discipline and dedication, they will in addition during the course of the year voluntarily agree to contribute a minimum of 50 to 100 hours per year from 1997-98 for making school education more effective and for establishing their own identities.

(2) These 100 hours will be utilised through systematic planning for teacher contribution and this will include training for development, guidance in the small group of pupils, consultation for developing team effect and working through quality circles in education. Each teacher will participate in a minimum of 3 workshops during the course of the year of 10 hours each so that his academic updatedness and professional character is maintained at a high level. The Ghokale Education Society will make arrangements for such workshops for meaningful involvement of all concerned.

(3) Achievement of a retention rate of a minimum of 65% at all levels in all standards at XII Std. exam by all schools and achievement of 90% or more performance at the S.S.C. level by 2000 A.D. with average performance of each student above 50% in each subject.

(4) This academic excellence is to be coupled with establishing the identity of each school as a dynamic institution through innovative activities and by maintaining cleanliness and quality in all aspects of institutional life and environment.

Enriching the society through school education is the ultimate objective for which all concerned have to commit and participate meaningfully for realizing the philosophy with a proper perspective and a pragmatic approach. It is on the basis of mutual trust and continuous training and re-training and team work with transparency in the working and administration of the institution that results will be achieved.

Enrichment courses will have to be introduced and integrated for on-the-job teacher development to support better teaching and effective procedures. Strong links will be established with the community and new and effective methods for participation will be aimed at.

'The students socio economic and family background' is an important aspect. 'School facilities and teacher characteristics' is another important factor. The collective effect of school factors and non-school factors must be studied and the focus should be to improve upon the students' behavior and students' attainments through the changing environment and the school should emerge as social institution for enriching the quality of life and living in the society. It is this ethos, the spirit, these "characteristics of schools as social institution" that will form the basis and through a series of workshops and other planned activities, the society proposes to ensure effectiveness of school education, in the secondary and higher secondary system.

The factors perceived to be associated with school effectiveness are as under:

1. Well defined and well formulated objectives for effectiveness and strong task orientation of faculty.
2. Well structured program for building student ability and maintaining student interest.
3. Leadership to be provided by the Head.
4. Recognition of achievement to be provided by the management
5. Concern on the part of parents and teachers for mutual respect, team work, trust, tolerance and consideration.

6. Financial resources to meet the needs of and for organizing training programs and co-curricular and extra-curricular activities.
7. Positive community relationship, student response and performance with a sense of continuity.

The organization will behave as an open system and with available expertise and active participation of all concerned; leadership will be developed and strategies will be adopted for building the climate, establishing a change agency, adopting a very positive approach and achieving the ultimate desideratum. With the commitment of the management, the leadership of the society, change readiness in the target group, and available resource persons and a monitoring mechanism, we are sure that innovation and integration will be effected so as to have understanding with a common wave length and achieving self-development and institutional effectiveness through this program.

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EVALUATION OF PROFESSIONAL DEVELOPMENT FOR TEACHERS IN AN INTERCONNECTED WORLD

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EVALUATION OF PROFESSIONAL DEVELOPMENT PROGRAMS FOR TEACHERS IN AN INTERCONNECTED WORLD

INTRODUCTION

Perceived deficiencies in student achievement, as is the case in mathematics and science in the United States, are producing considerable pressure to improve student performance. In addition, advances in our understanding of teaching and learning, along with the revolution in information and computing technology, promise to bring profound changes to the teaching profession. Teachers are not uniformly well-equipped to handle the challenges that lie ahead. In order for in-service teachers to apply novel and research based methodologies in the classroom, considerable work must be done to upgrade their skills and knowledge base. It is to be expected, therefore, that the professional development of teachers will assume even greater importance in the future than it does now.

It is surprising, however, to find that even though an extraordinary amount of money is being allocated for the professional development of teachers, it does not seem that a proportionate amount is being spent on evaluating the outcomes of these projects. For example, one of the largest such program is the Eisenhower Professional Development Program funded through the US Department of Education. A review of some three hundred projects funded through the Eisenhower Program reveals that evaluation accounts for less than four percent of the cost of the projects. Given that projects funded under this program are designed to respond to narrowly defined local needs, their overall budget is limited and hence, the evaluation efforts are quite modest.

Underfunding is not the only reason why evaluation of professional development programs is often poorly designed, is often incomplete and often falls short of the standards defined in the literature [1]. Scriven [2] describes ten competencies that he believes an evaluator should have. He takes great pains to distinguish between a (professional) evaluator and someone who does evaluation. As Scriven himself states, the competencies, though minimal in his view, are not easy to find in one individual. It is arguable, even if funding were available, whether it would be possible to find the number of evaluators with the right credentials to evaluate the large number of projects that are running concurrently. Consequently, much of the evaluation carried out in connection

with professional development programs is carried out by highly qualified and able individuals but whose expertise is not necessarily in the kind of evaluation advocated by Scriven.

A third problem associated with the evaluation of professional development programs is the lack of specificity in evaluation requirements from the agencies funding the programs. While most funded projects are required to submit an evaluation plan and a report at the conclusion of the projects, there is very little guidance to applicants on the design of the evaluation plans. Moreover, as Scriven [2] points out, the lack of qualified evaluators is felt not only in the evaluation of projects but also at the review level. Consequently, there is considerable disparity in the quality, focus, and design of evaluation plans even across fairly similar projects.

In this paper, we describe the efforts of one particular agency funding Eisenhower projects to align evaluation plans to maximize the benefits of the evaluation efforts. The Texas Higher Education Coordinating Board awards an average of over 50 professional development grants under the Eisenhower Program each year. Since 1985, it has awarded close to $32 million dollars to 696 projects, serving 45,387 participants and affecting some 1,500,000 students. Until recently, there were few requirements on evaluation from the agency. Since 1992, the agency has grappled with the problem of improving the quality of the evaluation component of funded projects. Over the last two years, it set out on a course to define for project directors and evaluators, a set of expectations for both evaluation and final reporting.

By formulating questions that the evaluators are supposed to address, applicants for professional development project funds know what to expect and evaluators do not have to start the design process from scratch each time. According to the Program Evaluation Standards, sound evaluation of educational programs and projects should have four basic attributes: Utility, Feasibility, Propriety, and Accuracy. Limitation of funds, personnel time and access to participants place serious constraints on the ability of project directors and evaluators to meet all four attributes satisfactorily. However, since the majority of successful applicants are funded more than once, it is understood by the funding agency as well as by the project principals that the evaluation design and evaluation instruments will be refined and the quality of the evaluation will improve over time. Technical assistance is provided as needed to ensure that the evaluation effort is sustained.

EVALUATION FRAMEWORK

One of the greatest difficulties in designing a framework to fit the several dozen projects running concurrently is to find a sufficiently rich area of common interests to evaluate without becoming very prescriptive. There are some projects addressing deficiencies in mathematics, others in science and others still in mathematics and science. There are projects intended for elementary, middle and secondary school teachers. The subject matter is as diverse as the institutions applying. Even in this diversity, however, it was clear that all of the projects were trying to:

1. Increase the content knowledge of the participating teachers.
2. Model new practices in the classroom.
3. Provide support for implementation of these new practices in the classroom.

We refer to these three dimensions of the projects as Content, Methodology and Implementation. Questions are posed for each of these dimensions in order to:

1. Facilitate the work of the evaluators
2. Provide common areas of inquiry so that standards of evaluating final reports can be developed.

Content

To facilitate the development of an evaluation plan for the content dimension of the professional development program, project directors and evaluators are encouraged to address the following questions:

Pre Intervention:

1. Do participants have sufficient operational knowledge of concepts required to participate in the program?
2. Is the knowledge sufficiently deep and conceptual that project activities can take place without much hindrance or that participants will actually benefit?
3. To what extent are participants familiar with project content?
4. Are participants familiar with the manipulatives they will be expected to use in the project (where applicable)?
5. Are participants familiar with the terminology used in the project?

Post Intervention:

1. Do participants show gain in content knowledge?
2. Has participants' conceptual mastery improved?
3. Has the use of manipulatives improved at the end of the project (where applicable)?
4. Has there been an improvement in the use of scientific terminology at the end of the project?

Answering these questions is a complex exercise and cannot be done through a simple pre- and post-test design, nor can it be done without prior planning. Evaluators are encouraged to design evaluation exercises through which the above questions can be answered. An example of a design that could be used is given below. This design was inspired by the National Assessment of Educational Progress (NAEP):

A: Formulate measurable content objectives for the project.

B: Identify content area(s) participants ought to be familiar with.
Identify content area(s) participants should know but probably do not.
Identify content area(s) to be covered in Institute.

C: Design pre-test questions at different conceptual levels along the format suggested by the table below. The number of levels is not pre-determined but generally Level 1 is purely operational knowledge and Level 4 is highly conceptual.

	Level			
Content Area	**1**	**2**	**3**	**4**
1				
2				
3				

D: Design post-test similarly.

Analysis of the results can take many forms, from statistical comparison of aggregate scores to comparison of frequencies to item analysis. Evaluators are encouraged to develop means of answering the above questions in a manner most suited to their background and experience.

Methodology

For this dimension, evaluators and project directors are encouraged to answer the following questions:

Are appropriate pedagogical behaviors being modelled by Institute director(s)?

Are these pedagogical methods useful for underrepresented/ disadvantaged groups?

Are participants deriving benefit from them?

Suggestions on how to answer these questions include survey of participants, structured journaling, and self- evaluation.

A by-product of defining questions for the evaluators and the project directors has been to focus their attention on the particular techniques they want to employ in their intervention. For example, the pedagogical behaviors were described mostly in general terms in the proposals. The first question forced the project directors to articulate the precise behaviors they wanted to model and, as a consequence, evaluate whether these behaviors were having the desired effect on the participating teachers.

Implementation

For this third dimension, the evaluation questions include:

Are the participants using or adapting modelled behavior in their teaching?

In what ways has participation improved classroom implementation?

Forms of evaluation include classroom observation, interview and journaling. The project directors and evaluators working together are encouraged to develop and submit an observation form specific to the implementation objectives of the project.

Technology

In cases where technology is used for professional development, the questions that need to be answered are:

Is the technology conducive to professional development activities?

Are the participants sufficiently comfortable with the technology to participate fully?

Are means available to resolve problems promptly?

Is support available for off-line activities?

Classroom Performance of Students

At present, the evaluation framework does not include activities to evaluate the impact of the professional development programs on the classroom performance of students. It was felt that there are too many confounding variables and time and money constraints are too great to permit a realistic assessment of this impact. However, some tentative steps through observation and interview are being taken to determine future lines of attack in this direction.

REPORTING

One of the standards listed under the Utility attribute of the Program Evaluation Standards is Report Clarity. It states specifically that:

Evaluation reports should clearly describe the program being evaluated, including its context, and the purposes, procedures, and findings of the evaluation, so that essential information is provided and easily understood.

Good reporting is therefore emphasized. In addition to results of data analysis (quantitative and qualitative), evaluators are required to provide sample instruments and their own formal analytical view of the project. Among the questions they are expected to address are:

1. To what degree were project objectives met?
2. Were the needs of underrepresented/disadvantaged groups met?
3. What were some of the striking successes?
4. What were some of the problems encountered during the project?
5. What actions can be taken to ensure that these problems do not re-occur in future projects?
6. What were some of the implications for the Local Education Authority of having their teachers participate in the project?
7. What does the future hold for the project?

ANALYSIS OF FINAL REPORT

The final report is viewed as an important instrument that provides a comprehensive view of project activities, project implementation and project achievements. By working with an intersection of attributes across all projects, it is possible to gain some insight into the comparative strengths and

weaknesses of the funded projects. This in turn provides additional support to decisions on future funding. To facilitate this process, the matrix given in Figure 1is proposed as a model of evaluating project reports. Assessing the value of the final report provides an opportunity for the agency to provide feedback (Figure 2) to the project directors. The project directors are then provided an opportunity to respond to the comments. The final report, along with the comments and response become part of the record of the project.

CONCLUSION

The evaluation model described here represents an effort to gain better understanding of projects. It is still at an early stage of development and use. Its value is its wide acceptance as a starting point for evaluation activities. More work needs to be done to ascertain the degree to which the evaluation efforts stand up to evaluation standards.

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FINAL PROJECT REPORT EVALUATION MATRIX

	CRITERIA	1	2	3	4
PRESENTATION	Organization				
	Clarity				
	Completeness				
CONTENT	Design of Instruments for Assessment of Gain in Content Knowledge				
	Analysis of Quantitative Data				
	Analysis of Qualitative Data				
METHODOLOGY	Design of Instruments for Assessment of Effectiveness of Methodology				
	Analysis of Quantitative Data				
	Analysis of Qualitative Data				
IMPLEMENTATION	Design of Instruments for Assessment of Implementation Objectives				
	Analysis of Quantitative Data				
	Analysis of Qualitative Data				
SUMMARY	Realization of Project Objectives				
	Needs of Underrepresented/Disadvantaged Groups Met				
	Achievements				
	Difficulties				
	Implications for Schools/School District				
	Future of Project				
	OVERALL REPORT ASSESSMENT				

KEY: 1=Very Good 2=Good 3=Satisfactory 4=Poor

Figure 1

Agency Comments on Final Report

Project Director Response

Figure 2

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INTERNET RESOURCES FOR PROFESSIONAL DEVELOPMENT IN TESTING

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Until recently, teachers in developing countries had limited resources for professional development. Meagre library collections and journal subscriptions coupled with the difficulties of attending outside professional conferences meant that teachers often fell behind current practice in their fields. This was especially true in the area of technology where changes are rapid.

Access to the Internet has radically improved the range of resources available to teachers and enabled them to participate more fully in global development. UAE University faculties involved with developing computer-based testing and computer adaptive testing have regularly accessed Internet resources in these innovative areas of testing. This paper describes how Internet access has benefited both university teachers and classroom teachers through outreach to the Ministry of Education. The presentation will highlight useful Internet resources on testing with particular focus on the effective use of technology for language testing. Since teachers in developing countries often have limited access to the Internet, specific techniques and strategies will be presented for making the most of a scarce but invaluable resource.

The impact of the Internet on international communication is well-known, but the Web's particular benefit for the professional development of teachers working in developing countries is less apparent. This paper examines ways in which access to the Internet facilitates professional development for teachers in the Developing World, suggests some ways in which to make the most of limited access time to this valuable resource, and demonstrates the effective use of the Internet to access information about English language testing. Addresses of useful language testing sites on the World Wide Web are cited in the paper.

Case study

Before access to the Internet became available in the United Arab Emirates, university teachers who were interested in keeping up with recent developments in their fields faced serious problems, particularly in rapidly changing areas of instructional technology where it was easy to fall behind very quickly. With the advent of the Internet in the UAE in 1995, rapid access to current materials for professional development meant that teachers were once again globally connected. They could read of new developments and teaching techniques, explore software and preview materials on the Web, participate in scholarly discussions about current issues, and actively take part in professional development without leaving the country. The Internet was a particular asset for English language teachers interested in computer-based testing (CBT) and computer adaptive testing (CAT) at a time when the TOEFL exam was being converted to a CAT format in centers all over the world. These are the exciting developments that I review below.

Professional Development Problems in the Developing World

Teachers in developing countries face several obstacles to ongoing professional development. Typically, educational institutions have only recently developed academic libraries, so their holdings are new and limited. Since acquisition of books and professional journals is very expensive, institutions sometimes limit access or circulation. When journals are available, they often arrive months after they are published and back issues are seldom available. Interlibrary loan services can be complicated, costly and time-consuming. Facilities for photocopying may be limited or nonexistent.

In addition to library issues which impede professional development, teachers in developing countries face other obstacles to keeping up in their fields. It is not easy for teachers to acquire recently published professional materials for their own collections. It is typical to find only a few bookstores in a country and imported publications are frequently exorbitantly expensive. In the West, teachers can easily acquire recent materials from publishers' representatives or when they attend book fairs at professional conferences, but teachers from developing countries may find it difficult to attend regional or international conferences for several reasons. Cost, of course, is a major factor and this includes not only the conference and transportation costs themselves, but also the labor costs of providing substitutes when the teacher is away. Additionally, some institutions fear that if their teachers attend international conferences, they will be enticed to work elsewhere. Because of all these

factors, in the past professional development they often meant acquiring a year's worth of self-study materials during annual leaves.

Can the Internet Help?

Faced with the obstacles to resource access outlined above, it is not surprising that teachers seldom participate in in-service training or professional development beyond that which is provided by their local institutions. This is particularly unfortunate with regard to instructional technology where constant changes mandate frequent updating of good pedagogical skills to use technology effectively. If teacher trainers don't update their technological skills, how can faculty in developing countries keep their skills current?

Is the Internet the solution to these problems? Yes, to a great extent. The Internet is a superb resource to help teachers keep abreast in their disciplines, access professional materials online, and participate in global discussions in their fields. However, Internet access by itself is not magic.

Teachers need administrative support for access and training, and they need to learn specific strategies for using their online time on the Internet wisely. Unfortunately, many administrators think that it is sufficient to merely provide limited Internet access without training. They are then disappointed when teachers do not use the Web to good advantage. Internet training rapidly repays for itself in more effective use of the Internet. When administrators themselves understand the cost-benefits of Internet access and training to promote and deliver ongoing professional development, they will be more willing to commit the resources to make Internet access and training for teachers a reality instead of magical thinking.

One of the first considerations is actual access to the Internet. Although most developing countries now have an Internet service provider, individual access is sometimes restricted and limited to a short period each week. In circumstances such as these, it is very important that training given to teachers includes a general orientation to using the Internet, a chance for hands-on practice with the different kinds of search engines available, and adequate time to develop skill in using the resource. Unfortunately, such training often neglects coverage of techniques for maximizing Internet time. Although this paper assumes general knowledge of Internet use, some specific techniques for making the most of limited Internet time will be dealt with here.

Strategies For Making The Most Of Online Connections

The first technique is to develop a productive search strategy before actually

going online. This means becoming familiar with the important concepts and keywords associated with a topic and having a general idea of where relevant information might be located. Bibliographies from professional monographs and journals, abstracts of articles, and titles of conference papers are all good sources for keywords, even if they are somewhat dated. An excellent source is the Educational Resources Information Center (ERIC) Thesaurus of keywords, a resource which is increasingly available even in small libraries on CD-ROM. A teacher with a focused search strategy can save precious time online by knowing how to expand or tighten a search for a particular subject.

A second effective Internet technique is to use the Bookmarking facility that is available with major Internet browsers such as Netscape. When a pertinent site is located on the Web, its electronic address or URL (Universal Record Locator) can be added to an ongoing list with a simple click of the mouse. Later, during off-line time, the list of bookmarks can be edited into categories and subtopics. The list of bookmarks can be saved to disk so that the teacher can quickly access productive Internet sites from any workstation.

Another timesaving technique for getting information from the Internet is to use "downloading", saving the information as a text (.txt) file to a disk. Internet sites have many long documents and papers that are best read when time is not of the essence. Having found a relevant document, the teacher can easily save it to disk and read it or print it out later. Downloading makes it possible to browse and speculatively choose to save a number of interesting documents without having to go through the process of evaluating the worth of each one, while still connected to the Internet.

A fourth strategy for maximizing limited connect time on the Internet is choosing a text-only format, sometimes also called a "without frames" format. By eliminating graphs when doing a quick search, the user is able to load individual sites far more quickly than when they contain graphics. Of course, graphics and multimedia are among the great pleasures in using the Internet, but when time is limited, working with a text-only file will speed the process.

A final strategy for expediting Internet searches is to get an overview of what is available in a particular field. Some Internet sites "point" to many other sites and it can be highly productive to include such useful sites on a bookmark list. As an example of some of the key sites in the field of English language testing, we will now sample some of the essential Internet sites that form the basis for more specialized searches. The list is meant to be illustrative of professional development opportunities for teachers in the area of testing instead of being

comprehensive. It should be noted that URLs or Internet addresses change from time to time; those provided here were functional in late November 1997.

Internet sites for professional development in language testing

The two basic techniques for finding information on the Internet are directories and search engines. With a directory search, one goes through hierarchies of information until reaching the appropriate level of specificity. For example, in using the Netscape directory, one first goes to Education, then Assessment, then to language testing, then to computerized language testing and so on. Using a search engine or Web Guide such as Lycos or Yahoo, one enters a keyword or group of keywords (such as "computer adaptive testing") and the search engine quickly performs a search of the data base to find information matching the descriptors. Clearly, both approaches have advantages and drawbacks. For initial searches, teachers might find that a directory approach gives them a better sense of Internet resources in their areas of interest, but for later focused searches, the search engine strategy targets a particular area more quickly. Most experienced users employ a mixture of the two approaches.

A directory approach might bring the teacher to the excellent Clearing house on Assessment and Evaluation provided by ERIC, the Educational Resources Information Center. This site (http://www.ericae.net) in itself provides linkage to a formidable range of resources including the ERIC Search Wizard, a prepackaged set of expert search strategies in areas including Information Technology, Teacher Education, Assessment and Higher Education. Other useful aspects of the ERIC site are the ERIC Thesaurus online which facilitates finding keywords for further searches and RIE, Resources in Education.

On the other hand, a search approach on Yahoo yields the Educational Standards and Testing site (http://www.yahoo.com/Education/Educational_Standards_and_Testing) which has many linkages to a wide variety of other sites on testing. As is often the case, the sites from the U.S. or the U.K . tend to favor testing links in their own countries. Thus, Yahoo, an American search engine, focuses on information regarding U.S. standardized tests.

University sites are gold mines of testing information. For general testing linkages, the University of California at Los Angeles maintains an Internet site for the National Center for Research on Evaluation Standards and Student Testing, also known as CRESST. This site (http://cresst96.cse.ucla.edu/index.htm) is

funded by the U.S. Department of Education and is primarily useful for K-12 educational testing. It should be noted that despite national biases, most comprehensive academic sites are now quite global in their coverage and will often point to relevant sites in a variety of countries.

Language testers consider the University of Surrey's Resources in Language Testing site (http://www.surrey.ac.uk/ELI/ltr.html) to be invaluable. Dr. Glenn Fulcher maintains this site which directs the searcher to virtually all of the important general and language assessment sites on the Internet. In addition, Dr. Fulcher also provides the Language Tester's Guide to Cyberspace (http://www.surrey.ac.uk/ELI/cybertxt.html), an essay which describes and evaluates the usefulness of Internet testing sites. Another useful feature of the University of Surrey site is the database for scholarly dissertations in testing which is maintained there.

Language teachers often need to choose appropriate tests for their programs or their students. Several Internet sites provide detailed information on a range of tests and sometimes even include sample test items. For tests by British examination boards, a good source is the English Language Examinations site which surveys tests by Cambridge, Oxford, IELTS and other testing boards (http://www.ilcgroup.com/ILC_ExamsBC.html). An American counterpart is to be found at the site maintained by Educational Testing Service (http://www.ets.org/), the developers of TOEFL, GRE and other standardized tests. These sites help teachers determine which tests are most appropriate for their students and also provide specific information on test specifications for preparing the students to sit the exams.

A major advantage of using the Internet for professional development is the availability of information from professional organizations and journals. For example, the American Psychological Association, long a standard bearer in the field of testing, has a homepage (http://www.apa.org/) where teachers can access hundreds of documents, in addition to updating themselves on recent testing standards. Both IATEFL and TESOL, the major professional organizations for English language teachers, maintain Web pages and online discussion groups called listservs. The TESOL discussion group called TESL-L posts useful articles and summaries of professional discussions about testing issues at its site (gopher://CUNYVM.CUNY.EDU:70/11/Subject%20Specific%20Gophers/teslfl/Teacher%20Training%20Resources/TESL-L%20Archives/Testing%20and%20Evaluation TESL-L). Teachers with email can join one of these discussions and get useful comments on pedagogical matters from their colleagues all over the world.

Some professional journals now appear online as EJs or electronic journals such as TESL-EJ. Other journals maintain an electronic form on the Web which provides a synopsis of current articles whilst publishing the full articles in the traditional printed form. Typical examples are the Chronicle of Higher Education and the Times Higher Education. However, given that these two are weekly publications, teachers in remote locations can remain current in rapidly changing areas such as technology instead of waiting months for paper copies to arrive. Journals such as Language Testing Update from the University of Lancaster, provide online summaries of recent publications and news of upcoming professional conferences at their site (http://www.ling.lancs.ac.uk/pubs/ltu/ltumain.htm). In fact, many professional conferences now publish proceedings online so that they are globally available.

In other cases, individual scholars maintain Web sites where current articles can be read or downloaded. For example, current articles on language testing can be found at http://ilc2.doshisha.ac.jp/users/kkitao/library/article/test/ and abstracts of recent monographs are available at the ETS site (http://www.toefl.org/monogrph.html). By regularly accessing these types of Internet resources, teachers can remain current in their fields without ever leaving their workplace wherever it may be in the world. In this way, interlibrary loan can be used effectively as a secondary source for obtaining longer monographs once they have been identified on the Internet.

Teachers with an interest in computer based testing can explore several commercial Internet sites where they can actually try out software. Assessment Systems Corporation (http://www.assess.com/ascgenrl.html#genrl) is the largest supplier of software for test design and item analysis. Some teachers develop and administer tests with Question Mark, a type of software that can now deliver exams on the Internet in addition to classroom testing (http://www.questionmark.com/home.htm). Both of these sites provide samples of tests online so that teachers can try out testing software and determine its applicability for their students and programs.

The conversion of the TOEFL exam from its traditional paper-and-pencil format to a new computer adaptive testing (CAT) format has created a great deal of interest since the exam is administered worldwide. Many teachers who regarded computer based testing as a thing of the future, now realize that the future is upon them and urgently need to update themselves on an unfamiliar testing method. Educational Testing Service is using its Internet sites to provide

information for students as well as teachers and researchers. Their site on the new TOEFL 2000 (http://www.toefl.org/comptest.html) uses a FAQ or "frequently asked questions" format to address common concerns. The queries range from practical to theoretical matters.

Computer adaptive testing individually tailors the examination items according to the pattern of a candidate's previous responses. In other words, if the respondent was successful with previous items, the next items selected are more challenging. This continues until the candidate experiences failure, then somewhat less challenging items are presented. The advantage of CAT over traditional standardized testing is that it can quickly and accurately ascertain the candidate's level of ability. Teachers who want to become more familiar with this recent form of technology can learn more about it at the University of Minnesota's CARLA website (http://carla.acad.umn.edu/CAT.html) which also employs a FAQ format. CARLA, or the Center for Advanced Research on Language Acquisition, (http://carla.acad.umn.edu/) exemplifies an Internet source for updates on leading-edge technology for teachers.

It should be clear that rapid changes in technology are impacting teachers wherever they live and work. Teachers cannot defer professional development because in an interconnected world, changes in technology and methodology permeate every corner of the globe. In the past, there were many reasons why teachers in developing countries were disadvantaged in keeping up with changes in their professions. However, now the Internet can overcome many obstacles to ongoing professional development. It has been the goal of this paper to present some techniques and examples of using the Internet as a tool for professional growth and development.

THE SMALL WORLD PROJECT

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The communications revolution has made it possible to bring the world to the classroom. Many of today's schools are equipped with computers and most have access to the Internet. Teachers and students primarily use the Internet to locate information; in this field it is unsurpassed; a net link can provide access to more information on more subjects than a hundred libraries. The net can also provide a means of communicating with individuals and institutions almost anywhere in the world, and many schools make use of this facility to share information and ideas.

Like any tool, the Internet is as effective as the person using it. Using a library effectively requires the application of particular skills; as does using the net. Students need to be taught how to access information efficiently; and, having located relevant data, they need to be taught what to do with it. Social studies is concerned with similar skills. Social studies is concerned with teaching students to think; enhancing thinking skills is a major curriculum goal. If we allow students to complete a social studies assignment by simply accessing information on the net, downloading it, printing it and presenting it as a finished project, we are disregarding a major element, perhaps the major element, of social studies education, and we are ignoring the potential of the Internet. Most of us acknowledge that this is so and many teachers are concerned that students use of the Internet in social studies often involves moving information from a web page to the page of a project without passing the information through the brain of the student.

The same pattern can be evident when schools use the Internet to communicate with other schools. E-mail and the Internet have made the process of communicating with other schools rapid and cheap. Using these facilities children can "talk" to other kids their own age across the country and around

the world. But the little evidence we have on inter-school communication by e-mail and the Internet suggests that much of the "conversation" involved is superficial and pointless. Rather than advancing social studies skills and knowledge, many e-mail projects are often simply gimmicks which allow students and teachers to play with technology to no real purpose. There is a good deal of evidence to suggest that much of the e-mail transmitted between schools consists of superficial nonsense. Beasley (1990) argues that in many instances students' e-mail messages to each other resemble the kind of handwritten notes they pass to each other in class. Goldberg (1989) claims there is little evidence to suggest that when using electronic communication, teachers and students move from mundane conversation to a purposeful exchange of information.

Often e-mail exercises are the brain child of the school's computer nut who is more interested in playing with technology than in providing experiences for effective learning. Using computers to locate and transmit information may convince the school board that expensive equipment is being used efficiently, and it may impress parents by suggesting that their child's teacher is "up with the play," but using e-mail and the net to talk to children in other countries need not necessarily result in learning anything of value. Before beginning a communications exercise using the Internet or e-mail, teachers need to ask themselves, "Is the information which will be located and transmitted relevant and meaningful?" and "Could this information be processed more quickly and more effectively in other ways?" Computer technology should be used to enhance learning. If objectives can be met equally well using conventional resources, there is probably little need to use electronic technology. It has been our experience that computers can be used to encourage thinking and decision making by fostering skills involved in collecting and processing and presenting information. This paper describes an interactive exercise which used the Internet in a way which maximized resource use, inquiry learning and problem solving.

The Small World Project originated at the University of Waikato, New Zealand and involved seven primary schools in four different countries. Although we would have liked a wider spread of countries, we considered seven schools a manageable number. The students in all of the schools were aged between 11 and 14. One school was in a rural district, two in small towns, one in a village and three in cities or suburbs of cities. The project was designed to be a student centered, challenging exercise involving inquiry and problem solving. We decided to make the central problem finding the location

of each school in the project. Each school was allocated a code name and instructed that all communication was to be through the project's central home page or through the project's e-mail address.

Our time span was just six weeks. Sets of questions were sent out weekly on the home page for the first five weeks. Students in each school responded to these in the same week, sending their answers back to a central home page where they could be read by all participants. All of the answers received were accessible throughout the project.

The weekly questions covered a range of topics and the clues they provided allowed students to gradually identify the other participants by a process of elimination. The themes for each week were climate and weather; natural vegetation; land use and industry; historical events; recreational activities; and natural and man made features of the landscape. From the first set of answers students could determine the hemisphere and decide whether the school was in a temperate, tropical or arid zone. The second set of answers allowed them to identify the country, the third set the region within the country. The final set of answers was designed to allow all the participants to locate all of the other schools.

Projects involving kids talking to kids have a special element that should be considered. Such communication needs a personal touch. We introduced this by allocating each school a partner. The participants were asked to try and identify the location of every school, but they had to find out more about their partner school. They could do this by asking their partner school up to five additional questions on the weekly theme each week. These questions were asked by sending e-mail messages to their partner through the project's organizers. The organizers transferred the messages to the appropriate school. At the end of the project, in the sixth week, each school was asked to make a presentation on the project's home page, not about themselves, but about their partner. Two of these partnered schools arranged to participate in a one hour post project video conference.

Initial contacts were made in May and June. We made contact early because the project had to begin in the first week of the North American school year. While this was not the most convenient starting time, beginning the project any later would have run it into Spring vacation in some southern hemisphere schools. Our European school was in fact still on vacation when the project began. The students completed their research at home and forwarded their first week's answers from their teacher's personal computer.

Providing a brief outline of the project well ahead of the commencement time allowed schools time to prepare, and it allowed the organizers time to adjust the program where this proved necessary.

The number of schools participating needed to be manageable. We were aware that someone in New Zealand had to prepare the home page, transmit weekly questions, collate and display answers as they came in and transfer e-mail to partner schools. This involved a graduate student who organized the administration of the program. While we did not want to involve too many schools, we were anxious to have a variety of different locations. With this in mind, we explored the net and contacted some schools with home pages. None replied. This reinforced ideas we had developed on earlier projects; the best contacts are those you know and can depend on.

The project participants noted that the questions could have been better organized. For example, by the time they learned that a school's country capital was Ottawa, they already knew that the school was in Canada. Participants need copies of all the questions and replies and classes need to be the same age. On the positive side, students and teachers truly enjoyed the project. They liked answering questions and designing home pages. Those who participated in the video conference were especially pleased to see and hear their partners. Perhaps the most telling comment came from the students who said, "When can we do this again?"

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'Researchers in Teacher Education in India: Some Emerging Issues"

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Researches in Teacher Education in India: Some Emerging Issues

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Teacher education in India has a glorious heritage. The philosophy of the teachers and their teaching emerged on the basis of removing learner ignorance and to light a light in their life. This philosophy of teacher education in India has undergone changes from ancient to medieval to colonial and post-colonial times. The expansion of pre-service teacher education to meet the needs of unprecedented expansion of education in the post-independence period and the increased focus on in-service education of teachers on a continuous basis brought in its wake concomitant problems related to the quality of teacher education in the country. Different Education Commissions and various committees have voiced this growing concern. Finally in 1993, the govrnment of India gave the responsibility to maintain the quality and management of the teacher education to NCTE through an act of Parliament. The quality concern led to research, investigation and experimentation for improving the effectiveness of pre-service and in-service teacher education. The author of the present paper has made an attempt to find out the major areas or fields of research conducted in India before the formation of the National Council for Teacher Education in the first section of the paper. In the second section, the paper will highlight the critical review of the research which has already been carried out. It would facilitate in identifying the existing gaps and deficiencies as well as redundancies relating to the field of teacher education in India. The quality of teacher education has steadily been in decline over the years as the quantitative expansion and qualitative upgrading did not compliment each other. The author has raised certain emerging issues of research in teacher education which bear a global perspective such as Decentralization of Teacher Education, Awareness, Knowledge and Skill Based Curriculum for Innovative Teacher Education, Methodologies for dealing with heterogenous groups of students with varying capability and capabilities desirous to learn innovative and challenging courses of varied multi discipline courses like biostatistics, mole-nature neccessiting awareness and skills focused with accuracy etc., will be presented in the third section of the paper which will be followed by the Post-script in the fourth section of the paper.

Teacher education today is a quality control subsystem of every educational system. Mass literacy goals as well as the emergence of technology have metamorphosised the very character of teacher education and its philosophy.

The National Policy on Education, 1986, reflects precisely this change in its concept and practice. Now teacher education has extended its limit to the University teachers level also. The creation of the Academic Staff College under the aegis of the UGC is a case in point. No wonder then that teacher education has emerged as an important area of educational research. During the last fifty years (since 1941-1992), it is known from the various survey reports that about 400 research studies have been carried out in our country on teacher education. Out of the 388 studies 239 were conducted at Ph.D. level, 21 in other subjects, and 128 at project level studies. Researchers in the field have used different sets of variables to study teacher education. One set is concerned with a study of characteristics of teachers, student-teachers, institutions etc, a second set is linked with characteristics of teacher-educators, a third is related to training procedures, and a fourth to attitudinal and other changes in student-teachers or teachers. A brief review is made in the following section. Agarwal (1980) attempted to identify the motivational factors in B.Ed. trainees' choice of teaching as a profession. He found that factors such as desire to continue education, possibility of doing good to the country, interest in teaching, security of job and fulfillment of parents' wishes important in choice of teaching as a profession.

Mann (1980) tried to find out the concept of success in the teaching of different groups and compared the personality traits of successful teachers with those of unsuccessful teachers. He found that the personality of successful and unsuccessful teachers differed with respect to some selected factors. The successful teachers were significantly more expressive, ready to cooperate, attentive to pupils, generous to personal relations, bright and alert, fast in learning, efficient in abstract thinking, emotional in nature, realistic about life, effective in adjustment, dependable and conscientious than unsuccessful teachers.

Mohan (1980) studied the effectiveness of the teacher training programs in some selected colleges of education. He found that the teacher training departments neither had adequate buildings nor had equipment and hostel facilities for girls and boys.

Mutha (1980) attempted to identify the attitudinal, motivational and personality factors which differentiated effective teachers from ineffective ones. He found that gender, professional training, nature of schooling and income level were significantly associated with the teachers effectiveness. The set of personality variables viz. ascendence submission, anxiety, marital adjustment,

extroversion, neuroticism, job satisfaction and teaching attitude – significantly predict the teacher's effectiveness.

Gupta (1982) studied the effectiveness of the innovative methods in better learning and higher achievement in the colleges of education. He concludes that the methods of discussion, symposium and supervised study were more effective than the lecture method. The workshop method proved to be definitely superior in the case of the general groups as well as the higher intelligent group. He inferred that all innovative methods except the lecture-cum-discussion method had comparative merit against the lecture method.

In recent years, there has been a spurt in research activity. In addition to the National Council of Educational Research and Training (NCERT) New Delhi, a good many institutions at the state level such as State Institute of Education (SIE), State Council of Educational Research and Training (SCERT), University Department of Education (UDE) and some of the post graduate level Colleges of Teacher Education (CTE) now take up research projects associated with the various facts of teacher education in view of the emerging demands and challenges in the field of education in general and as a consequence of the exhortations and implementation of the provision of National Policy of Education, 1986.

The expansion of pre-service teacher education to meet the needs of unprecedented expansion of education in the post-independence period and the increased focus on the in-service education of teachers on a continuous basis brought in its wake concomitant problems relating to the quality of teacher education in the country. Different education commissions (Ministry of Education, 1953; Ministry of Education, 1966), various committees (Ministry of Education, 1963; NCERT, 1966) and the National Council of Teacher Education (NCTE, 1978) have voiced this growing concern.

The quality concerns led to research, investigation and experimentation for improving the effectiveness of pre-service and in-service teacher education. The spurt in this activity, in recent years, in this vital area of educational research become conspicuous from the fact that the first survey of Research in Education identified 45 studies during the decade and a half of educational research in the country (Buch 1974). The second survey of Research in Education covering the period 1973-78 identified 63 studies, while the third survey covering the period 1978-83 has recorded 116 studies. The studies conducted in the area of teaching and teacher behavior having direct relevance to teacher education can further swell the quantity of research in this area.

Context Surveys

Surveys of teacher education conducted periodically by institutions as well as individuals provide information relating to several context variables like the size of the institutions and facilities in terms of staff, equipment and materials obtaining in teacher training institutions. The surveys also provide information about the problems of teacher education and teachers in the case of in-service teacher education besides providing information regarding the different context variables. The surveys provide useful data for planning teacher education, both pre-service and in-service. Sharma (1982) surveyed the progress and problems of teacher education in India outlining the inadequacies of pre-service teacher education and builds a case for a continuous in-service teacher education program. Gupta (1980) surveys in-service education of teacher educators of teacher education in colleges of education. These national surveys are accompanied by the surveys of teacher education at the state level also. All these surveys have painted a dismal picture of teacher education so far as its qualitative aspects are concerned. Dearth of adequately trained staff and absence of adequate facilities are the predominant findings. The reasons for downward quality can be attributed to compromising with norms and dilution of academic standards. In 1982, Goyal attempted to develop a model for forecasting teacher manpower requirements through a study of the components causing teacher demand. The model is useful for planning teacher education facilities.

Another set of surveys refer to in-service teachers – their characteristics and problems, which provide context for organising in-service education of teachers. Buch (1978) surveyed the status of teachers based on the Third All India Educational Survey. The survey revealed that only 13.69 per cent of middle school teachers & 28.76 per cent of secondary school teachers had participated in some kind of in-service education program during the two years proceeding the survey. It reveals the magnitude of the yawning gap that needs to be bridged.

Sharma (1982), tracing the growth and development of in-service education for the secondary school teachers in the state of Bihar, discovered a declining trend in the in-service education program for the secondary teachers after the transfer of Extension service Centers to the states. Lakdawala (1977) revealed that the women teachers working in the secondary schools of Greater Bombay did not avail themselves of the facilities due to lack of time or incentives. Gupta (1978) surveyed the status of secondary school teachers of

Uttar Prades. Desai (1981) and Muddu (1978) surveyed the problems of teachers teaching the Marathi language and biological sciences respectively. In both the cases lack of facilities have emerged as disincentives in teaching. Thakur (1978) surveyed the working conditions of married women teachers in Assam while Mathur (1981) surveyed the mobility pattern of women teachers working in the higher secondary schools of Delhi in relation to their professional commitments. The study reveals a positive relationship between mobility and professional commitments.

Many of the surveys referred to above have mentioned the sample but do not provide the number of institutions approaches for collecting information and the number of institutions which actually supplied information. This does not allow the consumer the benefit of the information likely to influence the inferences made in the studies. Qualitative surveys of teacher education have yet to emerge. Moreover, comprehensive surveys at national and regional levels should be supplemented by micro surveys both in terms of geographical area as well as specific aspects of teacher education.

Research Gaps and Future Orientation

Research in teacher education does not have a long history. It is only for about the last two and half decades that research in this area began to be undertaken. Although the quantity of research in teacher education is increasing progressively, it leaves much to be desired in terms of the range of teacher education variables and quality. By analyzing the research conducted so far it is found that the gaps become quite conspicious. This section purports to highlight some of these gaps and charter future orientation.

There is no single study available on the evaluation of alternative models of teacher education. As a whole, the teaching effectiveness of teachers is not given due weight in the institutions where they serve. Without this, an organic model of teacher education would remain a dream reality. Also, the approach to the transaction of the teacher education curriculum needs to be researched. This whole area has remained ignored by the researchers in teacher education. Probably, the uniformity of the training patterns and the rigidity of the system for evolving and implementing teacher education programs, lack of facilities for trying out alternative programs and the absence of organisational support are responsible for this situation. With autonomous colleges of education coming up, this type of research should be encouraged in the years to come for evolving teacher education for the future.

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Studies have been made in the institutional context but no studies are available in variables related to the community context as well as the classroom context in teacher education. A number of studies are available where the classroom climate has been studied, but in case of teacher education institutions this area has not received adequate attention. Immediate studies are needed not only in teacher educator's classroom behaviour for covering theory courses but their supervisory behavior during practice teaching as well.

There is very little research available in the area of curriculum development and transaction in teacher education. The curriculum is revised mostly on an ad hoc basis in the absence of research. Curriculum areas are deleted and added. All this happens without any research evidence about the desirability or otherwise of the curriculum change. It is desirable to undertake research on curriculum development in teacher education, its transaction and evaluation to provide a research base. Similarly, more research on the application of educational technology to the transaction of teacher education is called for.

There is also a gap in process-product research in teacher education. The product variables cover student-teacher's immediate outcomes like achievement in theory, attitude and skills. There is no study regarding the follow up of the student-teachers when they assume teaching positions after completing their training. Only a couple of studies have been made related to long term outcomes. For example, Jangira (1979) reported a six months follow-up of the student-teachers after their assuming teaching positions and demonstrated the sustenance of training effects. It is desirable to study the transfer of training effects and their sustenance through follow-up research and relating it to pupils' achievement as this is the only way to validate teacher education models. Research relating to the modalities and practices in teacher education are also very limited in their range. Studies are available in the use of interaction analysis and microteaching as means of modifying teacher behavior. Simulation training exercises and teaching model based approaches are still awaiting applied research in teacher education in the country. Similarly, in the case of in-service teacher education little research is available regarding the use of distance learning techniques apart from evaluation studies conducted in the NCERT for the SITE, INSAT and Radio Utilisation Project. As these modalities are being increasingly used research will be fruitful for providing an empirical base for their effective utilization.

The trend towards quantitative growth of research in teacher education over the last decade is a healthy augury as its shows interest of the research workers in this area of educational research. Studies have appeared in context variables relating to institution, student-teacher characteristics, curriculum,

process-product variables, etc. But there are areas like curriculum development, practicing schools, cue resources of the student-teacher, their mediating responses, etc., which still need to be researched. Also, educational technology as a means of improving effectiveness of teacher education is an area which requires immediate research. Continuous research following up the training gains to study transfer of training and its sustenance will provide useful research-based guidelines for designing teacher education programs. Programmatic research within a viable conceptual frame accompanied by functional design and analysis of research will go a long way in improving research on teacher education in the times to come (Buch, 1987).

Emerging Research in Teacher Education

It is said that no system of education is better than its teachers, because the quality of education depends upon the teachers who serve it. The teachers form an indispensable part of any system of education. If the teachers are to fulfil their obligations as potential nation builders, they must be properly educated professionally. But Teacher Education in India is ailing. It suffers from ad hoc politicization, militancy and groupism among teacher educators, half-hearted efforts for developing teacher competencies among student teachers, careless implementation of in-service education programs, its divorce from realities of the schools, lack of financial support and the deterioration of educational standards. One of the reasons for suffering of teacher education is that the UGC has ceased to have interest in this area. The agencies involved in teacher education thus far have been: (a) UGC; (b) the state governments; (c) the University and (d) College of Education. It is, however, heartening that now the Ministry of Human Resource Development has been showing considerable interest in teacher education and seems anxious to restore its academic clan. The importance of teacher education at all levels and in all sectors of education has been accepted vehemently from the Wood's Dispatch to NEP-1986. The National Policy of Education, 1986 has specially recommended that – 'Teacher Education is a continuous process, and its pre-service and in-service components are inseparable. As the first step, the system of teacher education will be overhauled' (NPE 9.4)

The policy further recommended that District Institutes of Education and Training (DIET) will be established with the capability to organize pre-service and in-service courses for elementary school teachers and for the personnel working in non-formal and adult education. As DIETs get established sub-standard institutions will be phased out. Selected Secondary Teachers Training Colleges will be up graded to complement the work of State Council of

Educational Research and Training. The National Council for Teacher Education will be provided the necessary resources and capability to accredit institutions of teacher-education and provide guidance regarding curricula and methods. Networking arrangements will be created between institutions of teacher education and university department of education (9.6 NPE, 1986)

Following the NPE 1986, the Ministry of HRD has taken up in all earnestness worthwhile schemes for improvements of teacher education. They include establishment of DIET, Colleges of Teacher Education and Institute of Advanced Studies in Education.

The National Council for Teacher Education is the high-power body like Indian Medical Council (IMC) and All India Council for Technical Education (AICTE) which has the function to upgrade the quality of Teacher Education at all levels in the country. The Ministry of Education, Govt. of India, established in May, 1973, the National Council for Teacher Education usually termed as the NCTE, for maintaining the standards in Teacher Education in the country. It enjoys the status of an autonomous body. The NCTE formulated the objectives of teacher education, Curriculum Criteria etc. for Teacher Education.

The NCTE has been given the statutory status by the Parliament (NCTE Act, 1993). The Act has been passed by Parliament for the establishment of NCTE with a view to achieving planned and coordinated development of teacher education system for the country, the regulation and proper maintenance of norms and standards in the teacher education system and for matters connected therewith. It is to make recommendations to the central and state governments. Universities Grants Commission in the matter of preparation of suitable plans and programs in the field of teacher education on this background a Teacher Education Institute is to be planned in accordance with the fixed norms of a NCTE for fulfilling the objectives of Teacher Education.

The observed trends of research in teacher education made it quite clear that the writer has viewed education from the restricted angles. Thus it is evident that research should be conducted on the following ageas.

Research work should be taken up on policies and practices of teacher education. The Policy and criteria which have been set by the NCTE are to be examined through research. Policy research on teacher education is an emerging field of research.

After all, teacher education cannot be considered in isolation from its national and social obligations. A large number of Commissions and Committees on education enumerated goals for teacher education in different sets of circumstances. So research should be conducted tor find out how far these goals have been realised.

It is necessary to point out the gaps between functionality and set targets.

Research is urgently necessary to examine the role of the teacher in guiding students, building their character, promoting innovations, etc. It has become obligatory on the part of researchers to provide empirical evidence of how far existing teacher education is helpful in promoting such ideals.

Studies are required to be taken up for discovering about how teacher educators personal traits influence their teaching in the class room. It is necessary to identify the gaps between the types of students and teachers that enter the institutions of teacher education and the requirements of the emerging educational situations. Further studies are required to investigate the professional organisations of the teachers. Investigations are also required to be conducted on the management of teacher education.

The setting up of the National Council for Teacher Education through an Act of Parliament with statutory powers vested in it and adequately strong teeth to enforce compliance has brought about some hope. This apex body has identified certain critical pedagogical issues that need urgent investigation. The list that suggested 57 topics is sure to undergo many changes, as research in this field attains maturity. The NCTE must constantly revise and rectify the pedagogical norms on the basis of scientific research findings conducted with caution and precision.

The degree oriented individual research may lack depth due to various constraints. Furthermore, individuals can hardly attain individual studies, corporative studies and macro level studies. Such studies should be undertaken by professional institutions with a track record of excellence. Pooling the research potential; interweaving the intellectuals into an integrated instructional strategy; and a well designed multistage, multisector research policy relating to this field need to be designed. The emerging pedagogical approach of the technologically oriented 21st century needs a variety of research. Due to inroads of the Internet, LAN, WAN, WEB and the complexities of electronic communicative computer languages, the research in this field has to be analysed carefully.

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TEACHERS' EDUCATION IN THE VIEW OF THE COMPUTER SCIENCE DEMANDS

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TEACHERS' EDUCATION IN THE VIEW OF THE COMPUTER SCIENCE DEMANDS

Dr. Ruth da Cunha Pereira

The tendencies of educational projects point to the need for the formation of citizens that can face the technological development demands which characterize the modern world. The computer is one of the greatest inventions of man in modern times, that instigates his curiosity, being then a constant stimulus for his investigative activity.

Educators need, then, to deepen their studies on how this new instrument can turn out to be really useful in the teaching-learning process, looking for its theoretical basis in the psychogenesis of knowledge construction, lived out in the subject/object interaction when the student is intended to be the subject of his own learning.

In this sense, as we introduce the work with computer science in education, within the research project "Text production in the first grades of primary school and teachers' continuous education", being carried out in the Estácio de Sá University (UNESA), we have been trying to show how the computer could favor the conditions for the formation of readers/writers, thinking subjects, students of the first grades of primary school - who have failed more than once and who attend community schools near UNESA - taking part in the investigation. Teachers who are still doing the graduation course in this University, are also taking part in the research in order to become able to, take up their function as educators. The aim of the research is to rethink the pedagogical practice of the teacher who sees the computer being introduced in every area of life, including schools. It is necessary, then, that he lives out situations in which computer science is used as a didatical aid, regarding this tool as a means to help his teaching.

The aims of the research are, consequently, (1) to verify the effects of the utilization of the LOGO language for the production of texts, in their mother tongue, by children of the first grades of primary school; and (2) to explain the factors that are present in the pre-service and in the in-service process of the teachers' education in the face of the demands of the new information and communication technologies.

We are able to note how, with the support of stories, children create a symbolic universe which is not limited to the picture, only, but to their own production, starting with the formulation of hypothesis about writing and also from the activities that lead to reading and writing.

Such hypothesis have already been mentioned by Emília Ferreiro:

> *"... they are presented in a progression that goes from a conception of the writing, as being closely related to the drawing, to hypothesis made up by the school in which the relationship between writing and oral skills starts to be noticed." (Sabinson, 1985, p.21)*

The continuous contact with stories told in the classroom enabled the children to have greater interaction with writing material as well as to be able to observe and live out the richness comprehended in the acts of reading and writing, not only those from famous adults, like the great writers of children's stories, but from those with whom they live and have a stronger meaning in their lives, thus favoring the dynamism of the reading and writing activity.

Cagliari and Gnerre (1985), researching the ways children are introduced to reading and writing, remark that

> *"It can be said that from their first contact with the writing, children are submitted, in a systematic way, to a series of exercises that, progressively, keep them distant from the notion of the text, so natural for them in terms of oral production, when they enter school". (p.25)*

In fact, what we have noticed in the teaching of reading and writing is the mechanical reproduction of exercises and texts produced by other people, not giving the child liberty and creativity to express ideas of her own. We suppose they are able to write "sentences", "compositions", but these are, in fact, mere repetitions of sentences already made, without the basic characteristics of a text. It is an artificial relationship with the world of writing, sometimes caused by what we expect it will produce according to a pre-determined pattern. Such productions are poor in meaning because the fear of making mistakes and the worry about spelling rules overwhelm the child.

> *"It is, by the way, only from a natural relationship with the writing, that they will understand its communicability and, hence, the need to keep, in the memory, the form of the word." (Cagliari and Gnerre, 1985, p.26)*

Geraldi (1985) commented upon the child's natural relationship with language, in the act of school production. According to him, such an act must be linked to the movement of reflection or attempt of communication, using the

modalities of the oral or written language to establish its interlocution with the reader. In this case, the language will flow naturally, enabling him to be the "author" of his own productions. Otherwise he will be "returning, in writing, what the school told him, how the school told him" (p.26). Although, on the other hand, reading can sometimes be harmed by spelling and structural problems, the writer's spontaneity will give sense to the construction of a real text.

Text construction in the first grades of primary school sets up the possibility of giving the student the right to speak, to write out his story in which his life, his feelings and fantasies are revealed.

Kaufman and Rodriguez (1995) state that "the mission of the school is not to form writers but it is its unquestionable responsibility to see that all the children, egressed from its classes, were turned into people who write" (p.50). So they point out that writing has a transcendental value as far as the acquisition of knowledge is concerned, that is, it is not only used to tell something to somebody / far away groups, but to register the ownership of an object. It also works as a human dimension of making the message objective, of materializing ideas that may link, either in the group or from person to person, or even to determine an existential fact.

The Contribution of Computer Science

Computer science, applied to education, has been causing a real revolution in the concept of the teaching-learning process.

Considering the history of educational hardware development, it can be observed that the first programs produced are simply computerized versions of what had, then, been taking place in the classroom. Its origin has been in teaching through the use of machines, like, for instance, the one invented by Sidney Pressey, in 1924, to correct multiple choice tests and the one by B. F. Skinner, in 1950, for the use of the programd instruction in teaching (Valente, 1993). Such modality is, in fact, a computerized proposal of traditional teaching methods.

Another modality, however, will present the computer as an educational tool with which the learner solves problems related to several areas of knowledge, representing such a solution according to a program language, among other tasks. There is, therefore, the intention to build up an environment based on the solution of problems that is fundamental for learning (Piaget, 1995), and in the elaboration of projects (Dewey, 1978).

The use of a program language may, thus, have several advantages, as Valente (1993) states:

> *"First, computer languages are precise and not ambiguous. In this sense, they can be regarded as a mathematical language. Consequently, when the student represents the resolution of the problem, according to a computer program, he has a formal and precise description of his resolution. Second, this program can be checked along its execution. This way the student can verify his ideas and concepts. If there is something wrong, the student can analyze the program and identify the origin of the mistake. Both the representation of the problem solution as well as its depuration are very difficult to be obtained by the traditional teaching means." (p.9)*

In this sense, some computer languages are being developed, as is happening with LOGO, a program language proposed by Professor Seymour Papert, in the Massachusetts Institute of Technology (MIT), Boston, U.S.A. (Papert, 1986), used for communication between the person and the computer.

The LOGO language presents two fundamental characteristics concerning the implementation of a teaching technology based on the computer and the exploitation of different aspects typical of the learning process, having, thus, two stems: that of the computer and a pedagogical one. It is a programd language that is easily assimilated, thus favoring the exploitation of spatial activities, the use of accessible terminology and the capacity to create new terms and procedures.

The LOGO has been widely used with students of different teaching levels as well as in Special Education (handicapped students), as was evident in the Mercosul VII Educative Computer Science Congress (Fagundes, 1995), when it was possible (1) to verify the results obtained by teachers and pupils in terms of quality of education with the use of a constructivist environment of LOGO learning; (2) to discuss the need for curricular reformulation for the development and autonomy of man in the learning process, in the face of transformations caused by the use of new communication and information technologies in the different areas of knowledge and their practice; and (3) to analyze the pedagogical practices in LOGO and their products as a result of the improvement of teachers' formation.

In the search of unit education/work in a globalized society, as in the emerging one the end of the 20th century, on the eve of the 3rd Millennium, it is necessary at that the institution of teaching tries to find, in research,

effective ... for the formation of teachers: pre-service and in-service, so that human beings can have the possibility of facing the challenges of the modern world for school as well as for business. This must be considered for formal or informal teaching, in the presence or absence of the teacher, in artistic or technical fields, making man capable of solving problems and constructing knowledge (Piaget, 1993; Vygotsky, 1993).

On the basis of this new education/work integration process and the construction of knowledge, in a school of quality there certainly lies the formation of such a professional; the teacher, as Papert so well shows (1944): "The main practical problem is to find means through which teachers in different places in terms of disposition to carry out a task in function of the change, can do it"(p.76).

In the same way, among the different components that contribute to the development of activities in the area of computer science in education, the formation of professionals capable of mediating the pupil-computer interaction, the formation of the teacher has been a key element.

Besides that, it is important to emphasize that, when using the LOGO language, the person (child, young people or adult) accomplishes real linguistic work, as Barella (1993) says: "...it is made possible by the linguistic knowledge that the person has of his native language: the language the person speaks, which, in our case, would be Portuguese" (p.257).

The way, the author emphasizes, for the acquisition of the artificial computer language the person needs, is to think about his own native language, understanding its functions and specificities. As a pedagogical tool, the LOGO language can be extremely useful for the study of linguistic-cognitive phenomena.

Barella (1993) calls the attention of the researchers to a very important moment in the alphabetization process of the starting grades of primary school, when the child starts to understand our writing system (Ferreiro and Teberosky, 1991).

For the use of the computer with children, the chosen language was LOGO, proposed by Papert, which enables real linguistic work in the classroom. It has been observed that by acquiring the artificial computer language, teachers and students have the opportunity to think about their own language and understand its mechanisms and specifics, which helps the development of teachers' continuous educational process through reflection about their own pedagogical practice.

Some questions have been directing the present research such as:

- To what extent the utilization of different languages may favor the construction of texts by children of the first grades of primary school
- To what extent the utilization of the LOGO language with children of the first grades of the primary school favors their production of texts in Portuguese
- What factors can be identified in the pre-service and in the in-service teachers' education process, in the sense of meeting the demands of the new information and communication technologies

During the research, all the subjects of the study were involved in the process of rethinking their own practice as researchers. Based on a qualitative approach, the investigation of reality was possible in a contextualized way by monitoring children who have learning difficulties as well as comprehension of the change in the performance of the educator as mediator in the teaching-learning process.

Initially the students and teachers were given the chance to use the 'paint brush' as tool. The main feature of the second stage of the project was a mini-course aimed at preparing a group for the utilization of the LOGO language. We are, at present, working with KID PIX and introducing the MEGALOGO (Stuur, 1995). The MEGALOGO, in its turn, made it possible to deepen the studies on how to work with the children to make them capable of realizing their own projects in a program environment, as the author proposes.

We can emphasize the interactive aspect permeating the constructions of the subjects as Vygotsky recommends, favoring the logic of reasoning and allowing different forms of expression of the children in graphic creation as well as in text production in the native language. Computer science is being of great help in the subjects' learning, developing the logical reasoning, the autonomy and the initiative.

Conclusion

The development of the activities points to meaningful progress by the children, at their own pace, as well as by the teachers. The changing process of the teachers' performance as a result of computer science is obvious, even if it proceeds slowly because it requires a change in their mentality, in a continuous movement action/reflection/action.

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TEACH: Basis for Teacher Education Reform in Brunei Darussalam

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Abstract

Although initiatives by the Sultan Hassanal Bolkiah Institute of Education (SHBIE) to review its various pre-service teacher education curricula began almost two years ago, little progress has been made, apart from cosmetic tinkering. In analysing the factors associated with this predicament, which are apparently endemic to teacher education reform, the writer proposed a framework based on identifying and concentrating on five essential components of teacher education curricula, namely, **T**eaching practice, **E**ducation studies courses, **A**cademic studies courses, **C**urriculum studies courses and **H**elpful other courses (or **TEACH**).

This paper discusses the process of arriving at convergence in the approach to review SHBIE's pre-service teacher education curricula, including an example of a course revision from an earlier primary teacher education programs review. In particular, four general principles, namely those of **Articulation, Balance, Coherence** and **Differentiation,** are discussed in terms of the overall framework of **TEACH.** It is hoped that the sharing of Brunei Darussalam's recent experiences in teacher education reform could prompt others to document and disseminate similar experiences on a world-wide basis.

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Concerns

Teacher educators are often regarded as experts in curriculum development and reform. Few would hesitate to give advice on curriculum design, implementation and evaluation, whether solicited, as when they are consulted by Ministries of Education and schools on curriculum change, or not solicited, as when they prepare future teachers to be actively involved in curriculum innovations. In proferring advice, they would typically present an ideal scenario, often based on research and theory, and propose a scenario which attempts to bring the existing scenario closer to the ideal scenario.

As many a teacher educator would avow, in an ideal scenario for curriculum reform, it is desirable to observe a number of imperatives, such as the following:-

a) What teachers want to teach and how administrators want to manage are of less importance than what and how students learn.

b) What and how students learn would, however, need to take cognisance of their future needs, their abilities and interests as well as the existing resource constraints.

c) The future needs of students would depend on the expectations of the society, as well as of their future workplaces or institutions for continuing education.

d) In developing the whole individual, there is a need to articulate and co-ordinate the curriculum horizontally as well as vertically.

e) Since individuals differ in why, what and how they learn, there is a need for curriculum differentiation to provide for diversity of student needs.

f) As constraints would inevitably be encountered in attempting to optimize the development of all students, there is a need to innovate and especially to capitalize on the latest that educational or information technology has to offer.

Apart from the fact that few teacher educators are keen to reform their own

curricula, fewer still are likely to practise what they preach regarding curriculum reform. For example,

a) What lecturers want to teach and how their courses conform to administrative regulations seem to be more important than what and how students learn in determining teacher education curriculum content.

b) What and how students learn in teacher education are seldom based on relevant information on their future needs, their abilities and interests as well as the existing resource constraints.

c) While teacher education graduates will mostly serve schools and are likely to continue their professional development through in-service education, information on the present and future expectations of schools, as well as the in-service needs of teachers, is seldom systematically obtained and utilised in teacher education reform.

d) Since courses are conducted by individual lecturers who come from different departments, or even faculties, they tend to be highly compartmentalised and their articulation and progression, if any, are seldom viewed in terms of the development of the whole individual teacher.

e) Other than individualised supervision during teaching practice and the differentiated grading of courses, which could result in repetitions, there is hardly any provision for differentiation in the numbers and types of courses which all students are required to complete satisfactorily.

f) Many lecturers still confine themselves to the use of chalk-and-talk in delivering their lectures and some do not even use the chalkboard, let alone any technology.

Against the backdrop of such concerns, some two years ago the writer proposed that major reviews be carried out for all the main pre-service teacher education programs. To his surprise and disappointment, not only was the urgency for curriculum reform not widely shared, but the need to address fundamental issues was often lost in the preoccupation with preserving as much of the status quo as possible. What follows is a reflection of what transpired in the ongoing exercise which will soon be finalised and, in particular, to examine why it is apparently difficult to accept a proposal for making the critical re-examination of **TEACH**, which stands for the essential components of teacher education curricula, namely **T**eaching Practice, **E**ducational Studies, **A**cademic Studies, **C**urriculum Studies and **H**elpful Other Courses, the basis for teacher education of SHBIE's programs had also occurred on a smaller scale some five

years ago, this paper will also comment on some of the changes that have taken place.

Context

Before delving into the complex interplay of factors associated with SHBIE's efforts to bring about teacher education curriculum reform, it would be useful to outline the context in which the changes are expected to take place.

As in most countries, teacher education in Brunei Darussalam takes place in a tertiary institution. However, being a relatively small state, with a population of about 300,000, SHBIE is the only institution which prepares teachers for Bruneian schools. As a matter of fact, the Univesiti Brunei Darussalam (UBD) is the only university in the country and SHBIE is the largest of six faculties, with more than two-thirds of approximately 1,500 student enrolled in a variety of programs, ranging from those which are targetted at early childhood education, primary education, secondary education, special education and postgraduate education, to a variety of in-service education programs and courses.

UBD is also a relatively new university, which was established in 1985, a year after Brunei Darussalam attained independence. Understandably, at the outset, there were very few local staff but the proportion of expatriate staff is progressively declining with the implementation of the scheme for recruiting local graduates, initially as tutors and, after sponsoring them for Masters and Ph.D. programs overseas, appointing them as lecturers or even senior lecturers. Prior to becoming part of UBD in 1987, SHBIE was offering only sub-degree programs for preparing teachers for primary and secondary schools. With the amalgamation of SHBIE with UBD, not all lecturers were absorbed and, besides adopting the local staff development program of UBD, local staff of SHBIE have also been encouraged to upgrade themselves by being sponsored for Ph.D. programs overseas. Even though the rate of "localisation" at SHBIE is fairly rapid, expatriates effectively constitute about two-thirds of the total academic staff, if we exclude local staff who are on study leave overseas and take into consideration that there has been a substantial increase in the number and type of programs in recent years.

Since SHBIE is only a decade old as a university faculty, it does not have a strong tradition of research. As expatriate staff are on three-year contracts, albeit renewable, most are reluctant to commit themselves to long-term research projects, often preferring to conduct small-scale or short-term studies which

could result in publications that might support their applications for contract renewal. It was only two years ago that a concerted effort was made to develop a Collaborative Agenda for Research in Education, which involves collaboration not only within SHBIE but often also between SHBIE and schools or the Ministry of Education. A Centre for Applied Research in Education was set up only this year to help co-ordinate and support the collaborative research projects.

It is likewise the case that many expatriate staff are not to keen to be involved in developing new programs and courses, since there is no certainty that their contracts will continue to be renewed. In the case of secondary teacher education programs, courses in science and arts academic disciplines are conducted by other faculties. These faculties operate quite independently in determining the courses they will offer the students enrolled in the B.A.Ed. and B.Sc.Ed. programs of SHBIE. Unfortunately, there is a tendency to assume that what would normally constitute courses for B.A. and B.Sc. programs would also be appropriate for those who are preparing to be secondary school teachers. Since the proportion of expatriate staff in these faculties is also larger than that which obtains in SHBIE, there is a strong tendency to resist any attempts to depart from the existing situation where courses in academic disciplines constitute more than half of the teacher education programs and any reduction could imply possible staff redundancies.

Curriculum Review No. 1

When SHBIE became part of UBD in 1987, a number of degree programs, namely the B.A.Ed., B.Sc.Ed and B.A. Pri. Ed. programs, were introduced, while the Cert. Ed. program for preparing non-graduate primary school teachers was slightly revised. However, in 1992, it was felt that a review of the primary teacher education programs was necessary. Accordingly, a consultant from Australia was invited to assist in the curriculum review process. A major feature of the revised primary teacher education programs is the inclusion of a series of core courses, namely Pedagogical Studies I-III, which attempts to relate principles of teaching and learning to educational practice. As the writer was Co-ordinator of these courses, he introduced a number of new features, such as the following:-

a) Pedagogical Studies (PS) is defined as "the study of TEACHING aimed at facilitating (desirable) LEARNING (and development)."

b) PS courses are THEME-taught, with underpinning themes based on a

coherent model/framework, as shown in Fig. 1

c) The four basic Pedagogical Processes of PLANNING, INSTRUCTION, MANAGEMENT and EVALUATION receive recurring emphasis in a spiral manner.

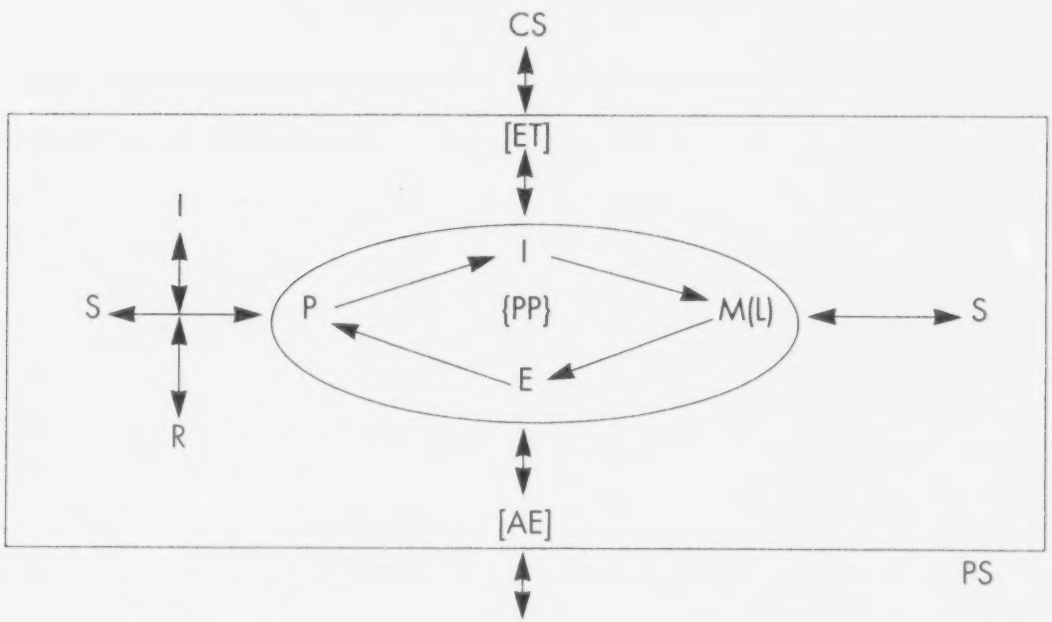
d) PS courses are OUTPUT-oriented, as well as INPUT-and PROCESS-oriented. The ideal output is to prepare teachers who are Skillful, Informed, and Reflective Strategists (SIRS). In PS I, the main emphasis is on being Informed of the Varied perspectives in PS. In PS II, the emphasis shifts towards learning to be Skillful and, because there are many skills to be mastered, Vicarious learning is encouraged through the group presentation of Intensive exploration of particular pedagogical skills. In PS III, an Extensive perspective is adopted, especially towards developing the Reflective professional, who would be capable of designing and conducting action research to improve his/her pedagogical practice.

e) As PS courses seek to articulate with Teaching Practice and Curriculum Studies courses, they are also TEAM-taught. Besides a core group who would hopefully follow a cohort through PS I to PS III, other staff are invited to lecture on aspects of teaching specific subjects in school.

f) Special attention is also given to Educational Technology, which includes Information Technology, and to Assessment & Evaluation.

g) Two other major underlying themes are emphasised in PS courses, namely:

Fig. 1 Model for Pedagogical Studies



TP

Legend:	PS	=	Pedagogical Studies
	CS	=	**C**urriculum **S**tudies
	TP	=	**T**eaching **P**ractice
	{Teaching Skills	=	PS + CS + TP}
	[ET]	=	Educational Technology
	[AE]	=	Assessment & Evaluation
	{PP}	=	Pedagogical Processes
	P	=	Planning
	I	=	Instruction
	M(L)	=	Management (of Learning)
	E	=	Evaluation
	S	=	Skills
	I	=	Instruction
	R	=	Reflection
	S	=	***S**trategies*

1. Because of DIVERSITY in Learning, and Learning Environments, ADAPTIVE Teaching Strategies need to be sought in order to OPTIMISE Learning.
2. Teaching and Learning Approaches not only differ in Effectiveness and Efficiency with regard to different INDIVIDUALS, or groups of individuals, but they can always be FURTHER IMPROVED.

h) Since students enrolled in the B.A. in Primary Education and the Certificate in Education programs have not previously been exposed to educational principles and, upon graduation, are expected to have similar teaching duties in primary schools, they should attend the same PS lectures, even though they have separate tutorials and their assignments and examination are slightly different.

Curriculum Review No. 2

Prior to 1995, when program co-ordinators were appointed, the development and implementation of courses came under the purview of respective departmental heads, who were concerned mainly with the deployment of staff to conduct these courses, as well as the maintenance of standards. Thus, even when program co-ordinators were appointed, it was not easy to mobilise departmental heads to view programs as a whole in terms of their contribution towards developing the future teachers as desired by the

education system. When they began to embark on the exercise of reviewing the main pre-service programs, it was not too surprising that the process was slow and not very productive.

What seems to result is what the writer labelled "cosmetic tinkering." Hence, on several occasions, the writer attempted to suggest a more systematic and systemic approach. For example, in a paper, *A Suggested Perspective for the Review of SHBIE Programs and Development of Action Plans,* it was suggested that a starting point for the review of SHBIE programs was to scrutinize the Proceedings of the National Colloquium held in 1996. Specifically, each department was asked to reflect on the following eight pairs of Cs, which were suggested as characterizing the main ideas and issues of the colloquium (see pages 162 - 167 of the Proceedings):-

(i) *Change & Continuity*
(ii) *Context & Coherence*
(iii) *Comprehensiveness & Complementarity*
(iv) *Creativity & Credibility*
(v) *Confidence & Competence*
(vi) *Communication & Congruence*
(viii) *Commitment & Care*
(viii) *Co-operation & Competition*

These pairs of *C's* were then to be re-grouped under the three *"meta-strategies"* that are supposed to underpin the strategies for SHBIE's Strategic Plan:

a) The *Systemic meta-strategy* was defined as the *strategy of viewing the entire system, as well as its sub-systems and supra-systems, in terms of structural, functional and interactive relationships and relevant inputs, throughputs and outputs* and was shown to be closely related to three pairs of *C's*, namely *Change & Continuity, Context & Coherence and Comprehensiveness & Complementarity.*

b) The *Synergistic meta-strategy* was defined as the *strategy of generating wider-ranging, value-added outcomes through proactive planning and the innovative integration of otherwise disparate action* and was shown to be closely related to two pairs of *Cs*, namely *Creativity & Credibility* and *Confidence & Competence.*

c) The *Symbiotic meta-strategy* was defined as the *strategy of seeking collaborative involvement, and possible networking, of relevant*

stakeholders for mutual benefit and was shown to be closely related also to three pairs of Cs, namely *Communication & Congruence, Commitment & Care* and *Co-operation & Competition*.

In order to illustrate the use of the *Systemic meta-strategy* in reviewing each program, such as the primary teacher education programs, a systematic procedure was suggested along the following lines:-

i) The "program" was to be taken to include all related programs for the particular groups of teachers required by the educational system. For example, in reviewing the Primary Teacher Education Program in SHBIE, the following were included:

   (a) Certificate in Education program
   (b) BA Primary Education (pre-service) program
   (c) BA Primary Education (upgraders) program

ii) A list of important target behaviors, namely Attitudes (A), Skills (S) and Knowledge (K), was to be specified in terms of whether they are to be minimal (m) for all students, Optimal (O) for most students, or Maximal (M) for few students. [Attitudes would include values and beliefs, while Skills would include all pedagogical and human relation skills and competencies, and Knowledge would include content, pedagogical as well as pedagogical content knowledge.]

iii) Each reviewer, which includes all lecturers concerned with any of the courses involved, should specify whether the target behaviours, i.e. A, S or K, are meant to be m, O or M for a, b and/or c programs. While each reviewer could number each suggested combination consecutively (e.g. Amb1, SMa5, KOc3, etc.), when all reviewers submitted their lists, the total compilation would be re-numbered.

iv) Existing courses were similarly to be listed in terms of the main areas or components of the programs, namely Teaching practice (T), Education studies (E), Academic studies (A), Curriculum studies (C) and Helpful other courses (H). Again, if there were more than one course in main areas, they would be numbered consecutively (e.g. T2, E5, A12, C3 and H2).

v) For each of the target behaviours, the perceived relevant courses were to be specified in terms of whether they contribute to a Large (L), Moderate (M) or Small (S) extent towards each of the components, T, E, A, C, H. For example, for Amb1, the contributory courses could be T2S, E2S, E4M and C5M.

vi) Finally the programs were to be re-designed, taking into account important intra – and inter-program relationships.

A subsequent paper, *Glimpses of some initial thoughts on program review for SHBIE,* where further illustrations of important considerations for each of the eight pairs of C's did not seem to have the desired impact either.

In reflecting on the lack of success, the writer began to realise some possible shortcomings of his suggestions for curriculum review, such as the following:-

(a) It must have been difficult for staff to accept what was apparently a "top-down" approach, even though individually they are likely to subscribe to the suggestions made.

(b) At the same time, the task of spelling out specific target behaviors must have seemed daunting to many members of staff, especially in trying to relate to the meta-strategies.

(c) Besides the natural tendency to resist change, there is also the threat of having some of the courses, and perhaps even some of the staff, rendered redundant as a result of the review.

A change in tactic was therefore adopted. Although it was still found to be necessary to produce a paper (*TEACH: An attempt at catbelling SHBIE's program review*) in order to share his ideas, the writer discussed initially with members of the senior management committee, who, in turn, discussed with other staff and he interacted closely with the program coordinators who provided feedback on the reactions of other staff. Also, ideas which were more readily accepted were further clarified and elaborated on an informal basis. Although the process of program review is rather longdrawn and still ongoing, there are signs of convergence. What follows is a brief summary of some of the main areas of possible convergence.

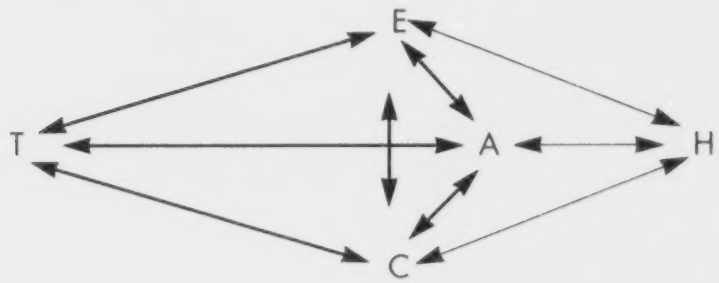
Convergence

The most encouraging breakthrough was the tacit acceptance of the overall framework called **TEACH** (Fig 2), which is being used to characterise SHBIE's revised programs, where the main components are closely inter-related, with primary emphasis on the Teaching Practice component.

There is also acceptance of the overriding principle of beginning the process of program review by considering the outputs in respect of teachers needed by schools in the immediate as well as in the long-term future. The **throughputs,** in terms of the main components of the curriculum, are then

taken into account. Some adjustments to the expected outputs and throughputs would finally be made when the **inputs** of staff and students are considered. It should be pointed ou that, typically, a reverse order is applied in designing or re-designing teacher education programs.

Fig. 2 TEACH; Proposed Model for SHBIE Programs



Legend:

T = **T**eaching Practice
E = **E**ducation Studies
A = **A**cademic Studies
C = **C**urriculum Studies
H = **H**elpful Other Courses

Note:
The Helpful Other Courses could include courses that support, or elective courses in, Education, Academic or Curriculum Studies. Likewise Curriculum Studies could include Teaching Practice in the form of micro-teaching or simulated teaching.

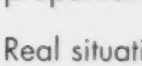
The use of feedback from the Ministry of Education, the schools and past graduates also went down well. Likewise, reference to the research literature provided useful support for the suggestions that were made. The educational research literature on "What makes a good teacher?" has, for example, provided useful clues from three separate sources. The process-product research on teaching which began in the early 1950s has identified important **skills**, such as set induction, time-on-task, pacing, wait time, higher order questioning, reinforcement, and so on (e.g. Brophy & Good, 1986). Although research on teacher knowledge began in the mid-1960s, it was the pioneering work of Shulman and his associates in the mid-1980s that characterised the

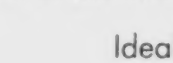
different kinds of knowledge that a good teacher should posses, especially "pedagogical content knowledge," or the knowledge of content which is transformed or re-represented in a form that can be readily understood by students (e.g. Shulman, 1987). With the advent of the information age, teachers need also to be better **informed** with regard to other sources of information, such as through cyberspace. Research which began in the mid-1970s stressed the importance of teacher thinking. In particular, good teachers were portrayed as **reflective** professionals, who would habitually reflect on their actions and, if necessary, conduct action research in order to improve their teaching (e.g. Clark & Peterson, 1986). It is therefore suggested that SHBIE's pre-service programs should strive to develop **skillful, informed** and **reflective** teachers.

In proposing changes to existing programs, a number of general principes, namely **Articulation, Balance, Coherence** and **Differentiation,** were also advocated. There principles are discussed briefly in terms of **TEACH** (Fig. 2) as follows:

Articulation is needed not only between programs so as to facilitate transfer from one program to another, albeit for a minority of students, who could obtain suitable exemptions for comparable courses, but also within programs. Both horizontal and vertical articulations within programs are envisaged. For example, the generic and specific teaching methods dealt with in Education Studies and Curriculum Studies courses, respectively, need to be articulated with what takes place in Teaching Practice. Similarly articulation of courses in successive years need to reflect a progression towards the development of skillful, informed and reflective professionals. For example, successive Teaching Practice experiences are not merely ritualistic repetitions but rather planned attempts to develop competence and confidence, initially in dealing with the class as a whole and progressively to cater effectively, efficiently and equitably to student diversity.

Balance is essential in order that no component is given undue emphasis nor inadequate attention, especially in terms of disproportionate distribution of time where the most important component, namely Teaching Practice, is accorded the lowest proportion of time. Typically, the existing and the ideal situations could be depicted by the left-hand side and the right-hand side, respectively, of the following figures, where the size denotes the relative proportion of time given to each of the five components:

Real situation: 

Ideal situation 

As the change from the real to the ideal would be a radical one that could threaten vested interests, the proposed mix would not depart too drastically from the existing situation. But it is hoped that this perspective is not lost sight of in future reviews.

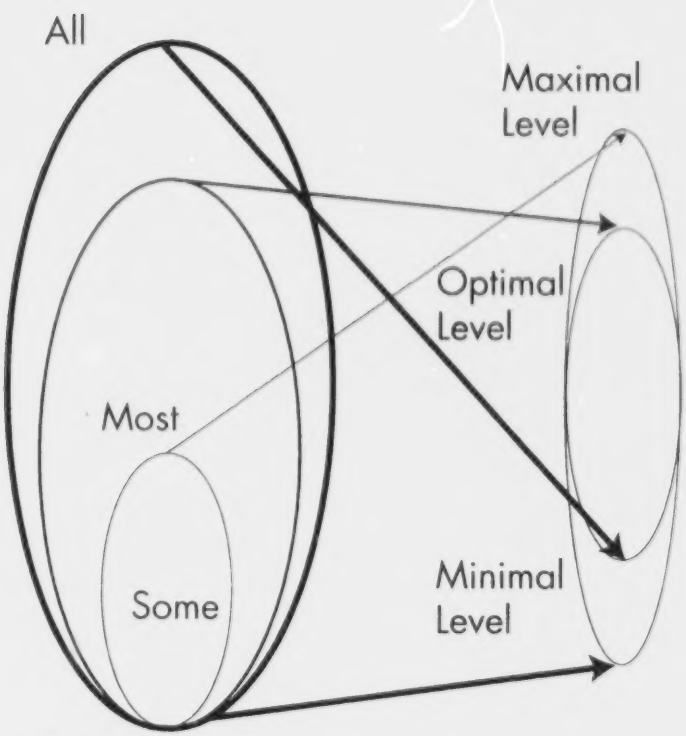
Coherence needs to be established not only for the program as a whole but also for each of the five components. While the Program Coordinators need to be absolutely clear regarding how the program would contribute towards the development of future teachers desired by the education system, they will also need to monitor how each component is contributing – including over-and under-contributing – towards the overall program. Without going into details of how each component is expected to manifest coherence not only in terms of its constituent courses but also in relation to th entire program, it might be helpful to indicate briefly what each component is intended to accomplish, as follows:

- **T**eaching Practice is intended to facilitate the development of competent, confident and caring teachers, through real or simulated practical teaching experiences.
- **E**ducation Studies courses are intended to provide enlightenment for understanding and investigation of the underlying principles of educational practice.
- **A**cademic Studies courses are intended to enhance the academic content knowledge, including pedagogical content knowledge, for the subjects that the students are likely to be teaching after graduation.
- **C**urriculum Studies courses are intended to focus on why, what and how the relevant curriculum subjects may be planned/re-planned, implemented and evaluated, especially in terms of teaching methods.
- **H**elpful Other courses, which are intended to help students derive maximum benefit from the other courses by equipping them (not necessarily all) with prerequisite knowledge and skills, as well as to cater to their individual strengths or weakness through elective courses.

Differentiation is important if we are truthful in accepting the reality of diversity among students. However, subjecting all students of a particular program through exactly the same treatments in order to produce differences in results is a poor demonstration of differentiation. Genuine differentiation would seriously attempt to define, and provide for attainment of, the minimal, optimal and maximal levels in learning outcomes expected of all, most and

some students, as shown in Fig. 3. For example, in Teaching Practice, we need, first of all, to be clear regarding the minimum acceptable level of performance by all student teachers, so that they do not become non-functional or dysfunctional in schools in the future. To use the teacher concerns model proposed by Frances Fuller (1974), the initial concerns of all student teachers with 'self' or 'survival' in terms of their new roles, work, time and energy commitments for teaching, need to be adequately met. Most students are likely to have concerns which go beyond 'self' to that of 'task' in that they are concerned about the available resources and their ability to perform as expected. Some students would be able to go beyond being concerned with 'task' to that of 'impact' in terms of being concerned about the consequences of trying to adapt their teaching to the interests and abilities of their pupils. Thus, Teaching Practice could prepare all students to be minimally competent, most students to be optimally competent and confident and some students to be maximally competent, confident and caring. Hopefully, all of them would also become cheerful teachers.

Fig 3. Treatment and Outcome Differentiation in Student Learning



The Helpful Other Courses are also meant to allow for differentiation among students. Besides the possibility of allowing different students to take different numbers and types of Elective courses, there could be differentiation in the levels of so-called University-required courses. Courses like English/Bahasa Melayu Language (proficiency), Critical Thinking, MIB and perhaps IT in Education, should have a placement test and require those who fail to take relevant basic courses, while at the same time providing optional advanced level courses for those who pass.

Since the three programs under review are targetted at different types of outputs, it is perhaps reasonable to expect some specific differences in the proposed revised programs. One obvious difference would be in the Academic Studies component. While the primary teacher education programs emphasise breadth in content, the secondary teacher education programs cater for more depth. In the case of the secondary programs, since most graduates are deployed to teach integrated science or combined science, rather than pure science, let alone sixth form science, besides recommending that the content of Academic Studies courses which would be relevant for preparing most students to teach pure science at GCE 'A' level be drastically reduced, additional content, in both Academic Studies and Curriculum Studies, would be required to enable all students to teach integrated/combined science. As a result, if the content in the science major subject cannot be reduced, some of the Elective courses under Helpful Other Courses would have to be replaced by more Academic Studies courses related to integrated/combined science. Thus, the number of units for Academic Studies is likely to be different for the science programs, as compared to the arts programs.

While some compromises are inevitable, it is hoped that a shift from being predominantly input-oriented towards becoming more output-oriented would be perceptible in the revised programs.

Conclusion

The foregoing account of some of the recent experiences in Brunei Darussalam at reforming its pre-service teacher education programs is probably not unlike many of the paths that have been traversed by teacher educators in other parts of the world. However, it is hoped that some features are new and "shareable". Perhaps it might encourage many others to document their experiences for wider dissemination through such world-wide fora as the ICET World Assembly.

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DEVELOPING A GRADUATE PROGRAM FOR INSERVICE TEACHERS: A COLLABORATIVE INTERNATIONAL PROJECT

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There is a need for in-service teachers to continue to enhance their instructional strategies in order to expand the learning opportunities of their students and better prepare them to live in our global society. One way in which this need is being addressed is through the collaborative efforts of educators at two teacher education programs. Since these programs are approximately five thousand miles apart, one at National University in San Jose, California, and the other at the National University of Ancash in Huaraz, Peru, information technology has played an important role in this international endeavor.

The author has been assisting in the development of a graduate program in Elementary Education at the National University of Ancash which is designed to meet the specific needs of in-service teachers in the villages and communities surrounding this university. Many of the challenges that the participants in this collaborative project have faced have been overcome through the individual and collective efforts of teacher educators who believe that each of us can be a change agent when it comes to providing a quality education to teachers and their students, both in our local neighborhoods and in our global community.

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Individuals of all ages benefit from experiential learning. The use of multimedia technology is one way in which to provide students with opportunities to construct their own knowledge while making learning more meaningful (Alley, 1996). If instructors of teacher education programs felt confident enough to model the use of instructional technology during their class sessions, I believe that there would be an increase in the implementation of technology in the primary, elementary, and secondary grades (Albright, 1996; Hunt, 1995). Teachers could then be taught how to incorporate technology in their daily lessons as well as how to provide hands-on technological opportunities for their students. In this way technology would serve as an impetus for experiential learning.

Although the implementation of instructional technology is needed at all levels of education, since it would foster a more "hands-on" approach to learning, many of our teacher education professors do not have the training, nor the technological equipment available to them, in order to demonstrate the effectiveness of this instructional strategy. According to Shenouda and Johnson (1995), teachers need to be trained to use technology if they are to help their students compete in our present day world. This phenomenon can only occur, however, if the faculty in teacher education programs prepare pre-service and in-service teachers to "participate in the information age professionally as well as personally" (p. 162).

Despite the results of studies indicating that the implementation of technology increases the effectiveness of instruction in teacher education programs (Bosworth & Welsh, 1993; Byrum & Cashman, 1993; Reyes, Torp, & Voelker, 1993; Woodrow, 1993), there are still university instructors waiting to be trained so that they, in turn, may enlighten their students. According to Dell and Disdier (1994), we need to go beyond the typical introductory courses offered to our pre-service teachers on computers and software selection and

model technology integration throughout all of our courses. This researcher contends that technology training should be connected to the instructional process and the curriculum being taught rather than occurring in isolation. She further emphasizes that educators must remember that technology is a means to an end, the end being to enhance teaching and learning.

When it comes to using technology in an educational setting, I find myself in a unique situation. First of all, I am one of those in-service teachers who has not been trained to incorporate technology in my daily lesson, nor have I been enlightened to use technology to assist me in developing colorful, individualized or classroom materials. Then, much to my chagrin, I am also one of those university instructors in a teacher education program who, up to this time, had no idea of how to implement, let alone demonstrate or model, the uses of technology in classroom instructional and learning situations. This knowledge has been a source of distress to me for several years. I am not alone in this plight, however, since pre-service and in-service teachers in many teacher education programs today are still being required to take only one fairly technical course in word processing which entails learning the basics about using a computer. In addition, time is often not provided for these pre-service or in-service teachers to explore some of the interactive software that is available for students in preschool through high school. This task has mainly been left up to the public schools. However, outside of providing a computer laboratory with a highly trained technician to run it, into which classrooms of students are scheduled once or twice a week for a period of approximately one hour, the public school system has not taught the majority of its teachers how to use technology as an engaging instructional tool, either. At best, school teachers may have a couple of computers in the classroom to use as tutorials, centers for learning games when students have free time, or stations at which they can record grades, draft letters to parents, or create lesson plans.

Bosch and Cardinale (1993) found, as a result of surveying 186 pre-service teachers who were enrolled in field experience classes, that 71 percent of their respondents neither used the computer for instructional purposes nor witnessed their resident teachers engaging in this process. The authors further reported one incident in which ten student teachers were placed in public school classrooms. During their assignments, not one of the student teachers observed a technology-based lesson led by a cooperating teacher. In fact, in most cases, the computers in the classrooms were used for drill and practice exercises only. In order to rectify situations of this nature, Wetzel (1993a) believes that pre-service teachers should be provided with opportunities during their student

teaching experiences to cement the technological training they hopefully are receiving throughout their core courses.

Often, in a university or public classroom setting, although an instructor may have the technical knowledge, an institution may not have the equipment that is needed in order for its faculty to implement multimedia integration. Furthermore, teachers may not be familiar with the interactive software available for use in preschool through twelfth grade classrooms. In response to this situation, Albright (1996) contends that when it comes to the teaching profession, instructional computer-related equipment should be considered essential tools of the trade.

Schmeltzer (1995) cites the United States Office of Technology Assessment as stating, in their report on "Teachers and Technology: Making the Connection," that they believe that the lack of teacher training is "one of the greatest roadblocks to integrating technology into the curriculum" (p.44).

In a recent edition of the journal of *Educational Leadership*, to which almost every public school administrator in the United States subscribes, Caverly, Peterson, and Mandeville (November, 1997) reported that across the nation, teachers still do not know how to integrate technology into their instruction or curriculum although schools have been acquiring computers for more than a decade. Since technology is constantly changing, teachers must be provided with on-going educational opportunities if they are to use this teaching tool successfully.

The faculty of the College of Education at the University of Nebraska at Omaha (Topp, Mortenson, & Grandgenett, 1995) decided to rectify this situation by providing their instructors with the training and equipment needed for them to "integrate technology into the design and delivery of curricula" (p. 3). As a result, three carts were designed and equipped with mobile media teaching stations. The stations consisted of a microcomputer, an overhead projector with an LCD panel, a video projector, a VCR, a laserdisc player, and a CD-ROM player. The carts which housed the stations were built to be moved from classroom to classroom.

Upon reading about how the teacher educators in Omaha had arisen to the technology challenge, I decided that I had a two-fold purpose for acquiring technological equipment along with the necessary training needed to implement these instructional tools. First of all, my preschoolers, many of whom are bilingual, would benefit tremendously from this investment of time and money. Secondly, I could use this equipment to assist the pre-service and in-

service teachers in my university classes, many of whom are fledgling teachers in my own school district, in becoming acquainted with the benefits of incorporating technology when preparing and presenting their classroom lessons.

Although I was not able to personally secure all of the technological aids just mentioned, I did acquire a computer with a color monitor, a microphone, and a CD-ROM player along with a color printer and scanner with the assistance of a colleague from the business sector. This gentleman not only assisted me in purchasing this equipment, but he spent, and continues to spend, untold hours teaching me how to operate and coordinate these technological tools as well. As a result, I was able to locate some suitable software, in the areas of emergent reading, mathematics, and reasoning skills, with which I am currently familiarizing myself. With the use of technology, I am also learning to prepare personalized bridging-to-home activities that my students and their parents can use in order to reinforce concepts, along with the receptive or recognition vocabulary, that my young students are learning.

Graziadei and McCombs (1995) believe that one of the benefits of multimedia technology is that it provides users with material in a variety of forms "such as text, audio, graphics, animation, and video" (p. 100). They further contend that the provision of images and sound in an instructional setting allows learners to engage multiple senses which makes the material that is to be learned more memorable. Multimedia technology equipment within university or public school classrooms allows learning experiences to be student-centered. In the university classroom, for instance, during a teacher-directed lesson, students may use the computer to share graphics or printed information, with the aid of an LCD on an overhead projector, creating as they share. In the elementary classroom, students may do the same. Graphics and written material may also be printed so that students are provided with something tangible to use when they work independently or in small groups. Lessons may also be individualized through the use of software that allows teachers to take pictures of their students to place at the top of their creative writings or other assignments. Other software programs allow students to change the beginnings, the middle, or the conclusions of stories. It soon becomes evident, as Curtin, Cochrane, Avila, Adams, Kasper, & Wubbena (1994) so aptly propose, that the roles of the teacher and the students become "increasingly blurred and blended" when technological resources are implemented in the classroom, thereby, providing optional avenues for learning (p. 78).

In addition to providing student-centered opportunities for learning,

interactive technology fosters student-driven learning.

Students are provided with a means of learning about a topic in depth. They automatically become more proactive in their learning as they become more proficient in operating technological equipment.

Kozma and Johnston (1991), after reviewing over 700 multimedia software programs, determined that interactive technology transforms student learning in seven major ways. They believe that learning moves:

- from a receptive mode to one of engagement.
  Students change from being passive recipients to active participants in the construction of their own knowledge.
- from the classroom to the real world
- from text to multiple representation
- from coverage to mastery
- from isolation to interconnectiveness
- from a emphasis solely on products to one that values processes
- from mechanics to understanding

As I have demonstrated, educational technology serves teachers and students equally. Although the step from using a computer for personal use to using a computer and related technological equipment in an instructional setting may be one of the most difficult ones for teachers to take (Roberts & Ferris, 1994); Wetzel, 1993b), it will probably be one of their most beneficial endeavors. Since an individual's quality of life depends, in large part, on his or her ability to live and be productive in a technological world, I cannot help but believe that in the near future, the majority of our teacher education programs will recognize the necessity of providing their instructors with the training and multimedia equipment that is needed for them to effectively model, and engage their pre-service and in-service teachers in, experiential, technological learning opportunities. Until then, individual teachers must do what they can to make learning more meaningful to their students.

This past summer I shared my personal attempts to stand in the technological gap in my classes at National University, in the Teacher Education Program, and in my special education classroom in the Alum Rock Union Elementary School District, in which I am one of over 800 teachers, at an international conference in Rio de Janeiro. After my presentation, I was approached by the Vice President of Academic Affairs at the National University of Ancash in Huarez, Peru, who asked if I would be willing to assist her in developing a Master's Degree Program for the in-service teachers in the schools surrounding

her university as well as for those in the remote villages of the Andes Mountains. Before leaving this conference, I made a commitment to collaborate with this university vice president and her teacher education faculty.

When I pause to reflect upon the ripple effect that my attempts at fulfilling my own technological needs have created, I am even more excited about pursuing a greater depth of knowledge and expertise in implementing instructional technology in all of the spheres of my educational endeavors. Not only have I been afforded the privilege of enhancing the educational opportunities of the young students that I teach in a public school setting, but I am also able to demonstrate the benefits of implementing instructional technology to pre-service and in-service teachers in the university classroom both at home and abroad. My quest for knowledge, as a life-long learner, has opened a window of opportunity for me to participate as a contributing member of our global society.

Although there is still a need to assist many pre-service and in-service teachers with the equipment and skills necessary to integrate instructional technology throughout their daily lessons, each of us, whether a university or classroom teacher, must explore every avenue possible that will allow us to upgrade our skills and to find community members who are willing to contribute to our students' future. According to Cooper (1997), today's "teachers need an 'attitude" that is fearless in the use of technology, that encourages them to take risks, and inspires them to become lifelong learners" (p. 2). Since change often begins with just one person, each of us must renew our commitment to be change agents by learning to use the "powerful instructional tool" of technology in order to better prepare our students to live effectively in our ever increasingly more technical, global society (Cooper, 1997; p. 1).

The development of the graduate program for in-service teachers in Huarez, Peru, is still in its formative stages since the collaborators have just recently concluded the first of a series of meetings and visits to the schools surrounding the National University of Ancash. However, it is the desire of the educators involved that instructional technology play a major role in all of the proposed courses. Since we live in a technological society, regardless of the country in which we reside, any educational program designed and implemented today must have a strong technology base if its students are to succeed in the future. May this tenet guide all educators as we strive to provide each of our students with the best education possible!

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RESEARCH FINDINGS IN TECHNOLOGY IN TEACHING AND LEARNING

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What are the latest findings in using technology in the K-12 classroom? Are teachers using the new technology? Why are many teachers not using technology in their teaching? What are the results when teachers use technology? What factors influence the integration of technology in the classroom?

In 1995, schools in the United States reported that for every nine students in the classroom there was at least one computer. Most schools had at least one television and one video recorder. Forty-one percent of the teachers at that time had TV in their own classrooms. Computer networks were found in 75% of our public schools and 35% had Internet access.

Yet, research shows that few teachers actually use computers for instructional purposes. Their use of other technologies such as CD ROMs, voice mail, and fax machines is also surprisingly low.

The Secretary's Commission on Achieving Necessary Skills (SCANS) Report brings out the fact that technology is an indispensable skill for students. This research investigates the latest findings in how technology is being used by teachers.

Research Findings in Technology in Teaching and Learning

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What are the latest findings in using technology in the K-12 classroom? Are teachers using the new technology? Why are many teachers not using technology in their teaching? What are the results when teachers use technology? What factors influence the integration of technology in the classroom?

According to the Office of Technology Assessment (OTA) in 1995, schools in the United States reported that for every nine students in the classroom there was at least one computer. Most schools had at least one television and one video recorder. Forty-one percent of the teachers at that time had TV in their own classrooms. Computer networks were found in 75% of our public schools and 35% had Internet access.

Yet, OTA research shows that few teachers actually use computers for instructional purposes. Their use of other technologies such as CD ROMs, voice mail, and fax machines is also surprisingly low.

The Secretary's Commission on Achieving Necessary Skills (SCANS) Report brings out the fact that technology is an indispensable skill for students (Office of Technology Assessment, 1995). This research investigates the current findings in how technology is being used by teachers. Let's look at some answers:

I. What are the latest findings in using technology in the K-12 classroom?

What is technology in the classroom? Technology itself may be defined as a tool that applies man's knowledge to do a job or produce a product. A hammer may be used to drive a nail. Used incorrectly, it could smash your thumb. Technology used correctly is beneficial; used incorrectly it can be painful.

Any tool used for teaching in the classroom can be classified as technology.

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Even the pencil is man's technological improvement over chalk and slate. However, when we refer to technology in the classroom today we mean computers, computer peripherals, CD-ROMs, laser discs, digital cameras, e-mail, the Internet, television, videos and all the software associated with these technologies. With these tools we do word processing, the most widely used technology, prepare spread sheets and databases, learn from computer assisted instruction such as drill and practice and tutorials, develop charts and graphs, and communicate electronically.

The President's Committee of Advisors on Science and Technology: Panel on Educational Technology has identified the following recommendations as most important for K-12 classroom uses of technology (Zenor, 1997, p. 2):

1. Focus on learning with technology, not about technology
2. Emphasize content and pedagogy, and not just hardware
3. Give special attention to professional development
4. Engage in realistic budgeting
5. Ensure equitable, universal access
6. Initiate a major program of experimental research"

II. Are teachers using the new technology?

Are teachers using the new technology in their classrooms? According to Herdman (Office of Technology Assessment, 1995) despite over a decade of investment in educational hardware and software, relatively few of the nation's 2.8 million teachers use technology in their teaching. Rusty Sweeny, an algebra teacher in Guilford, Maine, succinctly phrased the need for teachers to use technology in the classroom: "You wouldn't want a doctor to remove your gall bladder without the latest technology and the skill to use that technology, would you? It's the same with teaching. (Teachers need tools, skills) . . . it's a profession" (Office of Technology Asssessment, p.8).

Howie and Wen (1997) conducted a cross cultural study to determine teachers' attitudes toward using computers in education. They studied junior high school teachers in Taiwan and in California. They found the Taiwanese teachers attitudes related to:

1. age (the older the teacher, the more passive to the use of computers in education)

2. educational background (the higher the level of educational background, the more positive attitudes about using computers in the classroom)
3. where they graduated (those teachers who graduated from sciences or education were more open to using computers in their classrooms)
4. years of teaching experience (those with six or more years of experience were more negative about using computers in the classroom than were teachers with five or fewer years of experience)

Howie and Wen found that the teachers in the U. S. did not have the same variables as those listed above for the Taiwanese. They then assumed that computers were more commonplace in the U. S. It should be pointed out that the teachers they surveyed in California were from San Bernardino County which is not known for its poverty and its related risks for children and youth.

Brown and Henscheid (1997) recommend the PIG continium for getting teachers sucessfully involved in the use of technology in their classrooms. Step one is to have faculty involved teachers in a school that already has a successful technology program. Step two is to use the PIG (Presentation, Interactive, and Generative) method to catagorize the uses to which technology can be put. Step three is to utilize available assistance with implementation and assessment. Step four is to recycle; send the trained and successful teachers back to work as role models with the untrained/unsuccessful.

III. Why are many teachers not using technology in their teaching?

By the spring of 1995, in the United States there were nearly six million computers available for instructional purposes in our schools. Yet today a substantial number of teachers are not using this technology for instruction. Many teachers have not had adequate training in the use of technology or how to use it effectively in teaching (Office of Technology Assessment, 1995).

Kontos and Mitzell (1997) have indicated that it is not uncommon to have students in their classrooms who know more about technology than their teachers. However, most teachers do not have the self-confidence to allow their technologically talented students to share their knowledge with others in the classroom.

Morton (1998) rejects the idea of computers as a tool. He feels that such a designation relegates computer use in the classroom to the same status as pens, pencils, and paper clips. He feels that the computer and the technological capabilities it affords should be seen as an extension of the learner and that

such a view would revolutionize education. Morton further explains that those who refer to the computer as only a tool use that as justification for not being involved with computers and to maintain the 19th Century modes of teaching.

IV. What are the results when teachers use technology?

Sheinhgold (cited in Mehlinger, 1998) believes that three agenda are converging simultaneously to transform student learning and accomplishment in the next ten years. She points out that new cognitive theories in teaching and learning, new technological advances, and the emphasis on school restructuring are merging to bring about unusual possibilities for the redesign of education.

The overwhelming outcomes of present research supports the theory that technology, and the use of computers, can add value to learning when it is thoughtfully integrated into the curriculum. Teachers who are using these technologies report that they are more comfortable with students working independently and are able to present more complex materials, are able to adopt the role of a "guide on the side" rather than the "sage on the stage," spend more time on student-centered instruction than on lecturing, tailor their instruction more to meet individual needs of the student, and actually expect more from the student (Poole, 1997, p. 10).

In writing assignments, whether focused on learning-disabled or regular students, students using the computer as a writing tool generally felt more positive about their own writing skills, improved the quality and fluency of their writing, were more motivated to revise their work, and spent more time in the process of revising their drafts (Klenow, Van Dam, and Rankin, 1991; Kuith, 1987; Roblyer, 1988). According to a study by Dainte and Druidenier (1985), students who used the computer word processing for composing showed positive results relative to increasing their level of reading and made more revisions than when using only a wordprocessor.

In the area of problem solving and math, students who used the computer in their learning activities showed significantly greater gains that the control groups who did not use the computer (Foler, 1984; Roblyer, 1988; Fletcher, Hawley, and Piele, 1990). Science students who used computers in the science classroom enjoyed a more effective learning experience than students who studied in a conventional learning environment (Roblyer, 1988; Shaw and Okey, 1985).

V. What factors influence the integration of technology in the classroom?

1. The availability of computers. Mehlinger (1998) said that the use of computers in schools has grown from fewer than 50,000 in 1983 to an estimated 5.5 million in 1994. In 1983, only about 18% of the schools in the United Stated had a computer; by 1994, 98% of schools had a computer.

2. Knowing how to use computers. In an article in the U.S. News and World Report (December 2, 1996 cited in Hirschbuhl and Bishop, 1998)) six classrooms around the United States were highlighted as having successful technology integration with learning with exciting results for the students. The lessons from these schools are:

1. It's not the PCs that matter; it's how they are used
2. Let students learn at their own pace
3. E-mail can be more than something for chatting
4. Technology can help special kids, too
5. Unleash teachers to be creative
6. Use the Internet the right way

Additional guidelines offered by these schools include the following:

1. Beware of flash. Just because it looks slick does not mean it is good.
2. Use computers only where they make sense
3. Train teachers
4. Don't expect miracles (pp. 81-84).

Cooley and Reitz (1997) describe technology applications in the Westfield Washington Schools in Westfield, Indiana. In 1993, U.S. News and World Report cited the school district as being one of the top schools in the nation. In their review of their technological installation, including "fibre optics and copper cabling that connects four buildings and the public library with voice, data, and video applications" (p. 4), Cooley and Reitz list the following 11 lessons for success with technology in the schools.

"Lesson 1: Installation of technology does not translate into fewer personnel

Lesson 2: The school culture is a foreign land for new technology personnel

Lesson 3: Fear of change is a major barrier

Lesson 4: Schools must work with vendors in addressing school needs and requirements

Lesson 5: Be sure your consultant works toward your district's goals

Lesson 6: Selecting appropriate hardware is important; creating successful staff development and training opportunities is more important

Lesson 7: Administrators may not be prepared for the roles that technology creates

Lesson 8: Staff ownership contributes to program success

Lesson 9: Technology is not perfect

Lesson 10: Once you enter the technology race, you never finish

Lesson 11: The Big Lesson: Technology is a people thing" (pp. 4 - 9).

3. Comfort level. Shelley Jackson (1997), principal at the Brooklin School in Brooklin, Maine described a successful reaction to the introduction of technology in her rural school. Beginning with terms such as "Computerphobia, computer anxiety, technofear, and technopeasant" (p. 65), she surveyed her faculty with the Computer Opinion Survey published by Iowa State University Research Foundation and determined that her faculty had concerns but were open-minded about the onset of technology. To accommodate their comfort level, Jackson brought in a university professor to teach an introductory course in computers at the school. Because they were in comfortable surroundings and they had the time to become knowledgeable about the equipment, Jackson feels that their attempts at learning computer technology for the classroom were enhanced, their self confidence grew, and their willingness to try new approaches to using technology in the classroom developed very positively. This positive faculty change occurred between September and May of the same school year. Jackson's approach speaks well of her creativity and her willingness to have confidence in her faculty's development.

VI. Summary

Currently, more and more teachers are being "won over" to technology usage in the classroom. More time and money is being spent on staff

development programs for in-service teachers. More of those teachers who choose not to become involved with technology in their classrooms are retiring or leaving the profession.

Teacher training institutions are including more technology training in their pre-service teacher education programs. The National Council for Accreditation of Teacher Education has adopted standards for technology training in teacher education programs that were developed by the International Society for Technology in Education (Taylor and Wiebe, 1994).

The involvement of computers and other technology has moved in an evolutionary process through our schools. There are researchers who indicate, however, that we are on the threshold of a revolution. Lewis Perelman (Multimedia Today, 1995) calls it "the true revolution" (p. 123). He gives three reasons for his assessment of the coming revolution: "learning has become a transhuman, global process. . . learning is the core of what every viable worker and company does for a living . . . (and) . . . learning has been replaced by hyperlearning" (p. 123). Perelman concludes by saying that hyperlearning will bypass any hierarchial structure and is the antithesis of bureaucracy. Such an assessment leaves the reader to ponder whether schooling will become obsolete.

Halal and Liebowitz (November/December 1994) discuss this same revolution and attribute it to the use of multimedia in education. They indicate that ". . . the information-technology revolution is creating a new form of electronic, interactive education that should blossom into a lifelong learning system that allows almost anyone to learn almost anything from anywhere at anytime" (p. 229). They envision that schools modelled on those of the past are gone forever and turbulence will mark the transition to our future educational processes for all, everywhere.

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APPLYING WWW INTO INTERACTIVE IN-SERVICE EDUCATION

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SUMMARY

This study is to identify how to use World Wide Web (WWW) as a tool to implement interactive in-service education. By reviewing literature related to characteristics of WWW, Internet, hypertext, hypermedia, WWW in education, concept and structure of in-service education, the telecomputing learning activities were designed and presented.

For years, people have dreamt of the concept of sharing a universal database of knowledge-information which could be accessible to people around the world. By linking pieces of information, this universal database has become possible. The technology caught up with these dreams and made it possible to implement them on a global scale. The WWW is a wide-area hypermedia information retrieval initiative aiming to give universal access to a large universe of documents. It provides users on computer networks with a consistent means to access a variety of media in a simplified fashion. The WWW has changed the way people view and create information and created the first true global hypermedia network.

This research mainly concluded that through WWW learning activities in-service education activities could be structured and interactive learning activities could be modularized by operation methods, process functions, and linking styles.

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CHAPTER I. INTRODUCTION

Rapid information expansion forces our society and our living styles to change. Under these situations, the educational system benefits through using new technology, such as the photocopying machine, overhead projectors, desktop-publishing systems, satellite television, computer networks, computer-assisted instruction systems, FAX machines, etc.

On the contrary, these new forms of information technology act as a force to push educational systems to offer new educational services. These new services are available to help our students "learn how to learn," "learn how to think," and "learn how to create."

Human beings are facing a new technological revolution, called "the fourth revolution," which will change the way people learn (O'banion, 1987). Ashby (1967) identified four revolutions in education. The first revolution occurred when societies began to differentiate adult roles, and the task of educating the young was shifted, in part, from parents to teachers and from the home to the school. The second revolution was adopting the written word as a tool of education. The third revolution came with the invention of printing and subsequent wide availability of books. The fourth revolution, in Ashby's view, is portended by developments in electronics, notably those involving the radio, television, tape recorder, and computer.

The computer and computer networks now offer a profusion of options for teaching and learning. How well we, as educators, adopt this new technology to enhance teaching and learning is one of the challenges which we have to deal with currently. In terms of the challenge of exploding information, the core concern is how we manage the exploding information and how we help our students to remotely access information as essence of learning environment. From this point of view, a computer software to organize information gathered through computer networks is critically important. Computer networks provide new opportunities to create functional learning environments which allow students in many different locations to carry out joint educational activities (Moshe & Levin, 1985). Computer networking not only provides teachers with a new tool for delivering knowledge, but also provides students with a new manner of receiving, asking and reaching information they need. As a result, the method of choice for the learning, collecting, or delivering information will be through on-line access.

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Of the various methods of on-line access the most user-friendly and fastest growing vehicle is the World-Wide Web (WWW), using an interactive web browser as the search tool (Brown, 1994). The WWW provides the user with a dynamic multimedia, hypertext system that allows non-directional navigation of the Internet. It can also manage information in all multimedia formats, including text, graphics, sound, video, and various application programs. It can handle any type of data that can be stored in a computer system (Hahn & Stout, 1994).

The American Association of the Advancement of Science's Project 2061 Panel Report on Technology (1989) Stated, "Scientific literacy - which embraces science, mathematics, and technology - has emerged as a central goal of education. Yet the fact is that general scientific literacy eludes us in the United States" (p. vii). The traditional method of separating mathematics, science, and technology instruction into discrete subjects provides an unrealistic view of the world and the inter-relatedness of various types of knowledge used to solve problems (Wescott & Leduc, 1994).

Could the WWW work as a tool to help teachers implementing in-service learning activities? and How? Now is the time to face this problem.

Problem of the Study

The problem of this study is to identify how to use World-Wide Web (WWW) as a tool to implement in-service education.

Purpose of the Study

The ultimate purpose of this study is to design a proposed model for applying WWW to implement in-service education. More specifically, the objectives of this study are:

1. to determine the design principles of applying WWW to implement in-service learning activities;
2. to identify the main factors of modularizing learning activity design procedure;
3. to develop a model of applying WWW into in-service Learning Activities.

Need for the Study

The motivation for this study is the desire to provide a structured understanding of using the WWW as a tool to setup the learning environment for in-service education.

Undoubtedly, within most organizations the demands of a dynamically changing environment has necessitated the realization of many internal programs of re-adjustment. This implies the need for post-holders within an organization to acquire new skills and the knowledge needed to fulfill different job functions.

Questions of the Study

The questions of this study were structured to answer the following:

1. What are those characteristics of WWW?
2. What kind of hypertext and hypermedia is there behind the service of WWW?
3. How does the WWW service work with education?
4. What are the characteristics of in-service education are?
5. What is the structure of in-service interactive instruction?
6. How to implement the interactive in-service learning activities?
7. How is the model of applying WWW into in-service learning activities?

Procedures of the Study

The procedures of the study consisted of the following:

1. Identify a research problem.
2. Review literature related to in-service education, WWW application.
3. Setup an WWW server for simulating learning activities.
4. Run the proposed learning activities through WWW service.
5. Collect data from WWW service access records and analyze the data.
6. Develop a model for applying WWW into in-service learning activity.
7. Write a final report, summary, conclusion and recommendations.

CHAPTER II. LITERATURE REVIEW

The review of the literature relevant to both WWW and in-service education. In particular, the literature discussion centers around the following headings: (1) characteristics of WWW, (2) hypertext and hypermedia, (3) WWW in Education, (4) characteristic of in-service instruction.

Characteristics of WWW

For years, people have dreamt of the idea of sharing a universal database of knowledge-information which could be accessible to people around the world. By joining pieces of information, this universal database has become possible. The technology caught up with these dreams and made it possible to implement them on a global scale.

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Initially, the WWW is a wide-area hypermedia information retrieval system aiming to give universal access to a large universe of documents. It provides users on computer networks with a consistent means to access a variety of media in a simplified fashion. The WWW has changed the way people view and create information and created the first true global hypermedia network.

The earliest visions of such systems had the goal of the progression of science and education. Although the WWW project has the potential to make a significant impact in these areas, it is poised to change many elements of society, including commerce, politics, and literature.

The WWW was developed by researchers at CERN, the European Particle Physics Laboratory in Geneva. It is somewhat similar to a WAIS. But it's designed on a system known as hypertext. Words in one document could be linked to other documents. It's like sitting with an encyclopedia. You are reading an article, see a reference that interests you and so flip the pages to look up that reference.

The WWW is based on hypertext. It is possible for users to go travelling around the Web, bouncing from document to document, using nothing but the links in those documents. You can access the Web through a browser. A browser can read documents, fetch documents, access files by FTP, read Usenet newsgroups, telnet into remote sites, and even travel around Gopherspace. In general, it provides ability to access different resources on Internet at the same environment.

The Web is able to accomplish all of this by using the Universal Resource Locators, URLs. URLs list the exact location of Internet resource. Once everything has been given an address, it is easy to establish links between Internet resources. WWW does all the linking services behind the scenes. It is possible for you to bounce from one link to another without ever knowing the exact address of where you are, or even how you got there.

There are three basic types of WWW browsers available: 1). line-mode, 2) full screen browsers, and 3). graphical browsers.

Line-mode browsers are about as user un-friendly as you can get. It works at the process as you type a command, get some information on your screen, type a new command, get some more information, and so on.

A full screen browser puts a menu on your screen. You move the cursor up and down the screen, select a highlighted link, press enter or return, and you are automatically taken to a new document of file.

Graphical browsers which this study mainly focuses on allow you to access not only text, but also pictures and sound. These pictures can be put in WWW documents, making that WWW page more like a page from a color magazine. Most graphical browsers use a mouse, and you could point-and-click on a highlighted link to access it.

The WWW exists virtually - there is no standard way of viewing it or navigating around it. However, many software interfaces to the Web have similar functions and generally work the same way no matter what computer or type of display is used. In fact, many users navigate around the Web using text-only interfaces and are able to see all of the textual information a user with a graphic display world.

Below is a picture of the typical graphical WWW interface that you would see on a computer screen. It may be black or white or in color. In this example the interface - called a Web browser - works in a window and may be a software program on any computer with a graphic interface, such as a Macintosh or an IBM-compatible computer with Microsoft Windows.

The browser has a menu bar on top, where the user can quit, get help on using the program, and change certain display characteristics such as the screen font size, the background color, etc.

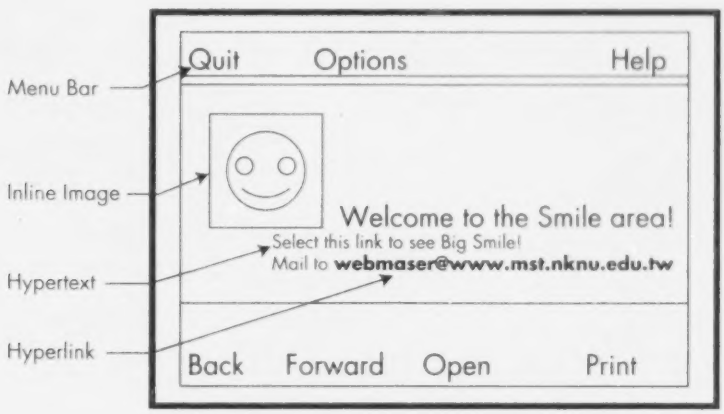

Figure 1 A typical Web browser for a graphic user interface.

A scroll bar allows the user to scroll the document page up and down. Because there is no limit to how wide or small a hypermedia document can be, scroll bars are often needed in case the document is larger than the viewing window.

Although there are many different ways to represent a document on the

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screen, it is often called a page. Usually, those responsible for creating a given collection of interrelated documents also create a special document which is intended to be viewed first - one that contains introductory information and/or a master menu of documents within that collection. This type of document is called a home page and is generally associated with a particular site, person, or named collection. The example shows the Smile Area's home page.

This document has a picture of a smile face, text in a bold font ("Welcome to the Smile Area!") and hypertext in which a single word is underlined. This word ("link") is a hyperlink (or link) - typically, clicking on it with a mouse will cause another document to appear on the screen, which may hold more images and hyperlinks to other places. There is no one way to represent text that is linked to other things - some browsers underline, others use special colors, and many give the user a variety of options.

Images such as the smile-face picture which are part of the document and are displayed within the page are called inline images.

Users could create their own personal documents with collections of their favorite links or biographical information and make them publicly available. These pages are called home pages (they are a virtual "home" for the user), they may be called "personal pages" or "hyplans" (hypermedia plans).

At the bottom of the screen is a set of navigation buttons - because a user might go to many different screens by selecting links in hypertext, there needs to be some method of retracing one's steps and reviewing the documents that have been explored. The back button shows the previously viewed document. The forward button would show the pages in the order the user previously viewed them.

An open button allows the user to connect to other documents and networked resources by specifying the address of the document or resource to connect to. The user might be able to connect to a document stored locally on the same machine being used or one stored somewhere in another country. Typically, such a document would be transferred over the Internet in its entirety.

The print button allows the user to print out the document seen on the screen. The user may be given the choice of printing the document with images and formatting as seen on the screen or as a text-only document.

The page lists an email address - webmaster@www.mst.nknu.edu.tw. A convention on the Web is to name the person in charge of administrating a WWW site a "webmaster" - any problems with the hyperlinks, images,

documents, or questions about the site should be mailed to a webmaster address.

Web software is designed around a distributed client-server architecture. A Web client (called a Web browser if it is intended for interactive use) is a program which can send requests for documents to any Web server. A Web server is a program that, upon receipt of a request, sends the document requested (or an error message if appropriate) back to the requesting client. Applying a distributed architecture means that a client program may be running on a completely separate machine from that of the server, possibly in another room or even in another country. Because the task of document storage is left to the server and the task of document presentation is left to the client, each program can concentrate on those duties and progress independently of each other.

Because servers usually operate only when documents are requested, they put a minimal amount of workload on the computers they run on.

The WWW is composed of thousands of these virtual transactions taking place per hour throughout the world, creating a web of information flow.

The language that Web clients and servers use to communicate with each other is called the Hypertext Transfer Protocol (HTTP). All Web clients and servers must be able to speak HTTP in order to send and receive hypermedia documents. For this reason, Web servers are often called HTTP servers.

The phrase "WWW" is often used to refer to the collective network of servers speaking HTTP as well as the global body of information available using the protocol.

Hypertext and Hypermedia

The operation of the Web relies mainly on hypertext as its means of interacting with users. Hypertext is basically the same as regular text - it can be stored, read, searched, or edited - with an important exception: hypertext contains connections within the text to other documents.

For instance, suppose you were able to somehow select (with a mouse or with your finger) the word "hypertext" in the sentence before this one. In a hypertext system, you would then have one or more documents related to hypertext appear before you a history of hypertext, for example, the Webster's definition of hypertext. These new texts would have links and connections to other documents - continually selecting text would take you on a free-associative

tour of information. In this way, hypertext links could create a complex virtual web of connection

Hypermedia is hypertext with a difference - hypermedia documents contain links not only to other pieces of text, but also to other forms of media - sounds, images, and movies. Images themselves can be selected to link to sounds or documents. Hypermedia simply combines hypertext and multimedia. Here are some simple examples of hypermedia:

- You are reading a text on the Chinese language. You select a Chinese phrase, then hear the phrase as spoken in the native tongue.
- You are a technology education student studying the Taiwan technology developing plan . By selecting a passage, you find reports from a 1995 National Science Council at NKNU. Cross-referenced hyperlinks allow you to view any one of related projects with audio annotations.
- Looking at a department's floor plan, you are able to select an office by touching a room. The professor's name and picture appears with a list of their current research projects.

The Web, although still in its infancy, has already enabled many of these examples. It facilitates the easy exchange of hypermedia through networked environments from anything as small as two Macintoshes connected together to something as large as the global Internet.

Currently the Web offers the following through a hypertext, and in some cases, hypermedia interface:

- Anything served through Gopher
- Anything served through WAIS (Wide-Area Information Servers)
- Anything served through anonymous FTP sites
- Full Archie services (a FTP search service)
- Full Veronica services (a Gopher search service)
- Full CSO, X.500, and whois services (Internet phone book services)
- Full finger services (an Internet user lookup program)
- Anything on Usenet
- Anything accessible through telnet
- Anything in hytelnet (a hypertext interface to telnet)

- Anything in techinfo or texinfo (forms of campus- wide information services)
- Anything in hyper-g (a networked hypertext system in use throughout Europe)
- Anything in the form of man pages
- HTML-formatted hypertext and hypermedia documents

The key to the Web's success lies in its ability to present information in a non-linear format. Though a user may begin with a given starting point (often known as a home page), where to go from there is up to the whim of that user. Order becomes irrelevant, at least in the traditional sense of reading a book from one end to another. Because the Web allows you to click and choose your next subject, you can skip over entire sections of information while nesting through others in great depth. This ability to "surf the 'Net," exploring the Internet with no defined end point or order, is known as hyper-navigation, and the form in which it appears on the Web is commonly referred to as hypertext.

Hypertext was first conceived of nearly 50 years ago when futurist Vannevar Bush published his article, *As We May Think* in the July 1945 issue of The Atlantic Monthly. In the piece, he discussed how society and technology must cope with the ever-increasing scientific advances in post-War America. Among other things, he predicted the invention of a curious device known as a Memex (or Memory Extender), a data storage device "in which an individual stores all his books, records, and communications, and which is mechanized so that it may be consulted with exceeding speed and flexibility." Electronic "links" would allow the Memex user to connect different points of information together, so he or she could go from one page of a book to another, or from one page to an entirely different publication or subject. There would be no convention of linking subjects together - the user of the Memex could link together anything at will. According to Bush:

The process of tying two items together is the important thing. . . . When the user is building a trail, he names it, inserts the name in his code book, and taps it out on his keyboard. Before him are the two items to be joined, projected onto adjacent viewing positions. Thereafter, at any time, when one of these items is in view, the other can be instantly recalled merely by tapping a button below the corresponding code space. Moreover, when numerous items have been thus joined together to form a trail, they can be reviewed in turn, rapidly or slowly, by deflecting a lever like that used for turning the pages of a book. It is exactly as though the physical items had been gathered together to form a

new book. It is more than this, for any item can be joined into numerous trails.

Though Bush's prediction of the actual technology involved isn't exactly as it turned out to be, his concepts of linking previously unassociated information was an intriguing idea. A Memex user could become the editor of a customized encyclopedia, a codex of knowledge presented in an customized fashion.

With the growth of the PC market in the late 70s and early 80s, hardware development picked up speed, as did consumer purchases and software design. With more people buying more computers and storing more information, the need for a simple, yet efficient way of accessing that information was obvious. Pioneering the way, among others, was Apple Computer, with its Hypercard software. Essentially a primitive form of Nelson's (and Bush's) vision of hypertext, Hypercard allows a user to create and organize the equivalent of digital 3x5 cards in a computer's memory. It is easy enough for all ages to use, yet Hypercard offers a handy way to arrange segmented bits of information and link them together in any order, even in a continuous loop. Hypercard stack can link you to the data on your computer, but it can't allow you to interact with other computer's data over a network. And by the mid- to late 1980s it was already clear that international networking was the next step into the Information Age. The WWW provided the right solution at the right time - sophisticated hypertext interconnected by an enormous lattice of computers.

But beyond the WWW's hypertextual architecture, it is the official standardization of hypertext publishing that has turned the Web into an international phenomenon. In order for the Web to work, all computers on the Web must be able to understand everyone else. If two computers each speaking a different language - or more accurately, if a person's Web navigation software can't understand another computer's hypertext, garbage instead of useful information appears on the screen. To alleviate this problem of incompatibility, researchers lead by teams at CERN and MIT have come up with what is called a standard generalized markup language for the Web. This standard, known as HTML (HyperText Markup Language), is a basic set of codes that can be added to any regular text. By including these codes, any computer on the Web can interpret that text as hypertext.

WWW in the Education

Of all the recent developments in advanced computer networking, it is the

WWW that has truly captured the imagination of millions of technol-philes and information buffs. Since its popularization in 1993, WWW (also known as W3 and the Web) has caught on like wildfire in business, research and academia, and many users now see it as the first real step to the creation of an "information superhighway." But for all of its profit-making and curiosity-seeking potential, WWW has largely been ignored as a powerful educational tool. Scattered throughout cyberspace, one can find occasional examples of educators, students and researchers experimenting with WWW as a way to teach and to empower students with newfound creative ability. Yet as a whole, on-line classrooms are few and far between, with recent reports suggesting that less that three percent of schools have Internet access.

What exactly does the WWW have to offer to education? You can begin by choosing from any of the following section

The advent of the WWW comes at an exciting, yet controversial juncture in American education reform. Though more detailed information on education reform policy can be found elsewhere on EdWeb, certain basic trends and terms should be mentioned briefly. Possibly the most important point that must be addressed is the current emphasis towards interactivity in the learning process. The term "interactivity" has become somewhat of a buzzword in American pop culture, education and commerce - for example, some software packages attempt to add to their appeal by emphasizing the product's "interactive" nature. In other words, passive learning doesn't work, yet interactive learning works wonders.

Yet beyond all of the hype and rhetoric surrounding interactivity in education, there is a solid backdrop of empirical analysis to support the positive nature of interactive learning. Simply put, students of all ages learn better when they are actively engaged in a process, whether that process comes in the form of a sophisticated multimedia package or a low-tech classroom debate on current events. Over the years, social scientists and education researchers have attempted with reasonable success to debunk the traditional notion of the passive classroom environment. But considering the nature of that notion - one teacher lecturing to a large class, encouraging informational absorption and regurgitation, and finally assessing the students by a series of simplistic standardized tests - it doesn't take a reformer with a Ph.D. in educational psychology to recognize that the old ways of teaching and learning need some serious restructuring. In order for today's young people to become competitive in tomorrow's marketplace, yesterday's pedagogical

methodology is no longer enough.

One of the key problems in education reform is that traditional teaching fails because students have no use or interest in much the material as it is presented, yet in order to expand their understanding of a given subject, they must become involved in the entire teaching process. For example, producing a physics experiment in order to actively discover the results, in addition to exploring the social context in which the original experiment was performed, has more educational value than merely hearing a lecture about how some scientist first attempted the experiment several centuries ago.

Engaging students from a variety of angles and allowing them to feel as if they are a part of the subject matter will often lead to them becoming more interested in (or at least more willing to discuss) that subject. Therefore, they invest more mental energy and thus commit the concept to memory with a better comprehensive understanding of it. Learning can be attained through the use of goal-based scenarios - the teacher, with a set of learning goals in hand, allows the students to explore the subject from their own particular point of view. Students, when encouraged and given the proper opportunity and medium, can express a wealth of opinions on nearly any subject. And by giving them the chance to articulate and share their thoughts, they can grasp the meaning of the subject and thus understand it better.

There are four essential roles the web takes on in relationship to education. These roles include the following:

- The Web as Tutor
- The Web as Publishing House
- The Web as Forum
- The Web as Navigator

Characteristics of the in-service instruction

In-service education might be held through institution or professional group according to different reasons. For those institutions maintaining stable growth, in-service education might focus on reminding routing procedure and extending leaderships. For those institutions facing fast changing, in-service education might focus on tasks changing or new information circulation. Some institutions consider in-service education as part of ladders of job promotion. Professional groups tend to exchange professional information through in-service education.

With the learners from real world, those characteristics of the in-service instruction are:

- on-target learning activities
- solving problems of both general and specific
- part of professional growing system
- flexible structured curriculum
- forming new connection between learners

CHAPTER III. METHODOLOGY

The procedures of the study consisted of the following:

1. Identify a research problem.
2. Review literature related to IN-SERVICE education, WWW application.
3. Setup an WWW server for simulating IN-SERVICE learning activities.
4. Run the proposed elementary IN-SERVICE learning activities through WWW service.
5. Collect data from WWW service access records and analyze the data.
6. Develop a model for applying WWW into IN-SERVICE learning activity.
7. Write a final report, summary, conclusion and recommendations.

The review of the literature relevant to both WWW and IN-SERVICE learning activities. In particular, the literature discussion centers around the following headings: (1) characteristics of WWW, (2) hypertext and hypermedia, (3) WWW in the Education, (4) characteristic of IN-SERVICE instruction.

By setting up WWW Server, the verification of IN-SERVICE learning activities required properties or functions were conducted. The hardware used was Pentium-100 PC with 16M Ram and 1.0G harddisk. The CGIs were written in PERL, C and Shell Script.

There were eight WWW IN-SERVICE learning activities designed and tested. Based on the result of verification process, design principles, modulations, and models were structured.

CHAPTER IV. FINDINGS

Because of the speedy development of technology, the learning activity of

students expands from class to home, outdoor or every region of society moreover the whole world. Instruction of in-service education emphasizes integrated teaching, it emphasize not only integration between courses but also integration between regions of the whole world and time and spaces. Hence, the future trend is that teachers will apply computer network into their instruction.

I. Design Principles

By reviewing the literature of in-service and exploring examples of on-line projects, the structure of activities were designed. The design principles are listed below:

- tied directly to the characteristic of in-service education
- could apply the interactive functions of WWW
- could be modularized

II. Modulations

For modularizing procedure, there were three main factors should be considered such as operation methods, functions of process, and linking styles.

1. By operation methods:

   a. Describe by HyperText
   b. Reference by linking between subjective
      Home page to Home page
      Topic to Topic
   c. Feed back and transmit data
      form
         command button
         check box
         option box
      e-mail

2. By functions of process

a. Reading and Understanding

   The HyperText describes the main purpose of this module. The learner understands the contents of HyperText through reading HyperText or augmented statements, and organizing the concepts of the documents.

b. Constructing the relationship between knowledge concepts

   The observation of the graph or image is the main purpose of this

module. The learner constructs the relationships between objectives on the graph or image by observing, recording, and thinking.

c. The thinking following definition and demonstration

In this module, the definition of a knowledge concept is the starting point and the purpose is to solve a problem. The learner solves the problem through the understanding of definition and examples.

d. The learner into doing linking thinking

Introducing thinking is the main purpose of this module. The learner finds out the method and rule that solving a problem by to answer a series sub-problems step by step.

e. Obtaining experience from trial and error

Trying each solution for the problem and obtaining the experience of problem solving.

f. Data process

The learner collects data from learner's feed back and reorganizes those data into a new question.

3. Linking styles

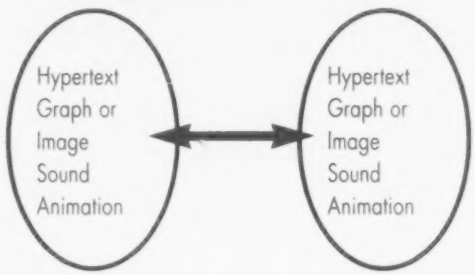

Figure 3 Possible linking styles of HyperText

In Figure 3, it displayed the possible linking element, such as text, graph, sound animation files.

III. Models of Applying WWW into IN-SERVICE Learning Activities

In Table 1, it showed models of applying WWW into IN-SERVICE learning activities. There were six styles:

1) reading and understanding,
2) construct the relationship between knowledge concepts,
3) thinking following definitions and demonstration,
4) force learner into doing linking thinking,
5) obtain experience from trial and error,

6) data process.

The fundamental procedures and structure were also listed.

Table 1
Models of Applying WWW into IN-SERVICE Learning Activities

Classification Style	Fundamental Procedures and Structure	Learning Structure	The Concept of Knowledge obtained from Learning
Reading and Understanding	1. Present the content 2. Reading and Understamdomg 3. Present question 4. Answer the question or writing a statement by reading 5. Data transmit, receive and correct	Reading Writing	Understanding of some concepts Organize and rally the knowledge The expression of language
Construct the relationship between knowledge concepts	1. Present graph and image 2. Observe and Record 3. Construct the relationship between objects 4. Present question 5. Answer the question following the relationship between objects 6. Data transmit, receive and correct	The reading of graph and image character of knowledge concept	The basic knowledge o object. Construct the concept of the mapping Forming of the space concept.
The thinking following definition and demonstration	1. Definition the concept of knowledge 2. Example 3. Present question 4. Solve the problem according to definition and example 5. Data transmit, receive and correct	Definition Problem	The forming of basic knowledge concept Thinking the origin of problem

Classification Style	Fundamental Procedures and Structure	Learning Structure	The Concept of Knowledge obtained from Learning
Forced learner into doing linking thinking	1. describe the background of problem 2. Present the series problem step by step 3. hands on or problem solving 4. Data recording 5. Find out the rule from data 6. Form a law 7. Prove or test 8. Data transmit, receive and correct	Example Deduce	Forming the abilities of observation, introduction and deduce Forming a scientific attitude
Obtain experience from try and error	1. Present question 2. Explore each possible way of problem solving. 3. Data transmit and receive 4. Data correct, Feedback and retry	Try and error	Explore each possible way of problem solving Try and error
Data process	1. Present question 2. Hands on and record 3. Data transmit and receive 4. Data collect and organize 5. Present a new question	Data feedback and process	Forming the ability of data process

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CHAPTER V. CONCLUSION

The first four chapters of this study addressed the introduction of the study, a review of the literature, methodology and procedures, and findings of the study. The purpose of this chapter is to draw conclusions based on the findings.

Conclusion

The major conclusion of this study is that it is possible to use WWW as a tool to implementing in-service learning activities. Based on the result of verification process, models of applying WWW service into in-service learning activities were structured. The design principle and modulation were also revealed..

The Goal of Modulation were listed below:

1. To create the fundamental CGI elements used in this module.
2. Developing a model that used to design the in-service instructional activities.
3. To accomplish WWW instruction in assisted learning activity for in-service education

The Advantage of Modulation were also concluded below:

1. The activity is based on the characteristic of in-service education and is assisted by the design of Hyperlink and HyperText. It will be easy to accomplish the instruction goal.
2. In accordance with the principle of classification we can easily control the structure and the basic procedures on the activity design.
3. Using modules to design the activity Home page of in-service learning and usage of engines, the difficulty on the activity design will be alleviated.

Telecommunication instruction not only can reduce the difference in learning for in-service learners but also can obtain the advantage on the sharing of resources and information.

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Innovative Teacher Practices in A First Nation's Community in Canada

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The Tsuu T'ina Nation has instituted new forms of community – controlled education over the past eight years designed to meet the unique needs of an expanding native student population. Teachers in various schools within this community face a variety of challenges working with different age groups in an alternate cultural setting. This paper provides a broad overview of the history of Tsuu T'ina education as background to an analysis of how teachers working with a variety of age groups are able to successfully mediate between the requirements of the formal curricula and the demands of the resident population for culturally-sensitive instruction. The significance of the Tsuu T'ina example for pre-service and in-service teacher training for all teachers working in cross-cultural contexts form the conclusions to this paper.

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Innovative Teacher Practices in A First Nation's Community in Canada

Introduction

Teachers now face the requirement of being competent in the diverse cultures that their student populations represent. The issue of "cultural competency" in the classroom is a complex one involving organizational, pedagogical and ideological issues. (Gollick and Chinn, 1990 Solomon, 1995) The early literature on multiculturalism and teaching emphasized reform ideals with culture as the central determinant in teaching and learning success. More recently, culture has been viewed as one of many processes at work in the classroom and there has been a more critical examination of how best to foster and encourage teacher awareness of alternative cultural perspectives. (Spindler and Spindler, 1994).

This paper uses a case study of the Tsuu T'ina Indians[1], a First Nations people, in Canada to illustrate how innovative teacher practices in community-controlled schools may inform pre-service and in-service training in multiculturalism. The need for cultural competencies during pre-service teacher training is generally addressed by the introduction of mandatory course completion. Student teachers are taught the goals and ideals of multicultural teaching often without any direct experience of alternate cultural settings (Hollins et al, 1994). The emphasis is explicitly on the blueprint notion of culture without a clear-cut explanation of the manner in which theoretical knowledge pertaining to multiculturalism can be applied.

For in-service training, a number of researchers have indicated that there is a high degree of resistance to courses in multiculturalism particularly if these courses are mandated top-down. Solomon notes that all individuals do not readily embrace growing diversity and that teacher response to in-service education preparing them for cultural diversity depends in part on how they conceptualize their work. (Solomon, 1995:251). Multicultural training may often be a passive process which is negatively-charged and may ultimately challenge the professional competence of teachers.

Methodology

It seemed therefore fruitful to begin to explore how teaching practices in an alternate cultural setting might address the issues which have arisen in pre-

[1] The Tsuu T'ina were formerly referred to as the Sarcee or Sarsi Indians.

service and in-service teacher training. The methodology employed for this purpose is based on a ethnographic study of teaching and learning experiences in the Chula School located on the Tsuu T'ina Reserve near Calgary, Alberta, undertaken during the 1993-1994 school term. Further research was completed in 1996 at the Adult Learning Center in the same community. The study employed participant observation in classrooms as well as informal interviews with administrators, teachers, students and parents. The research project with teachers was part of a broader study designed to identify issues and solutions for Tsuu T'ina students based on a comparative study of Calgary and Tsuu T'ina Reserve schools.

History and Background

Teachers of First Nations students in Canada face the often bitter legacy of over a century of government-controlled and church-run education which had a strongly assimilationist philosophy. During their early settlement on a reserve near Calgary, the education of the Tsuu T'ina came under the control of a resident Church of England missionary. A residential school established in 1895 was attended by virtually all Tsuu T'ina children between the ages of six and sixteen. The practice of traditional Native customs was repressed and the speaking of the Tsuu T'ina language discouraged by government and church officials. In 1921 a day school was built and the old system of residential schooling was abandoned.

There has never been any systematic tracking of the educational history of individual bands by local school boards, provinces or by the Federal Government in Canada. The general consensus among educational researchers based on more recent data, however, is that native education under government control in Canada was an unmitigated failure (Barman, 1986-87: 17) Several reports indicate the major trends in Tsuu T'ina education in the city environment. These trends parallel those found in other First Nations' communities. In 1970, a consultant's report noted that the general pattern was for student grades and attendance to decline commencing in grades IV to VI. The students entering Junior High School missed a great deal of school, were 15% below the class average and represented almost total failure by year's end. Less than 1% of the High School students were in academic programs and almost no boys were completing Grade 12 in the Calgary system (Stanley and Associates, 1970:14).

In 1978, a second report commissioned by the Band administration indicated that the average years of education was 8.7 for 220 individuals

interviewed. Of these individuals 23 (10%) had completed or were enrolled in Grade 12, 2 (.9%) in university or college and 52 (18%) were in some form of trade or technical training (Romney, 1978:4). By 1988, the dropout rate for high school students was an estimated 80%. Only seven Tsuu T'ina students completed university over a twenty year period. During the 1993-1994 school term, 27 students or roughly 10% of those enrolled in Calgary schools has dropped out .This included 10 of a total of 13 students enrolled in High School[2]. The Tsuu T'ina Band Administration opened the Chula Elementary School for K4, K5 and Grade 1 to 5 in September 1992 in an attempt to begin to redress these educational problems.

Teachers of Children and Adolescents

In 1993-1994, approximately 75% of elementary children attended the band-controlled school while the remainder were enrolled in fifteen schools in the city of Calgary. The Chula Elementary School employs fifteen staff members including eight certified teachers and seven support staff. Teachers are hired by an Education Committee consisting of Community representatives and School Administrators.

The Band Administration has mandated the preferential but not exclusive hiring of native teachers. The inclusion of non-native-staff is deemed necessary for the future participation of students in mainstream society. Support staff, tutors and others are hired directly from the Tsuu T'ina community. Attitudes towards teaching and learning in the school include several key elements: the validation of the Tsuu T'ina and native culture, the self-worth of the student, the provision of safe and comfortable learning, and the attainment of educational parity in terms of addressing learning delays.

One of the stronger links between the school staff and the Tsuu T'ina Nation lies in the commitment of teachers to adhere to the values and wishes of the community. This commitment involves extra hours in helping to organize and participate in community-based activities. The teachers also attempt to utilize the community environment in a frame of reference in the learning process. The inclusion of native curricular content at the school is deemed to be one of the most critical components of self-affirmation for the students.

The Chula School employed four native teachers and four non-native teachers during the 1993-1994 term. These individuals all had long-term teaching experiences in native communities. The teacher-pupil ratios in the Chula School are low with the average number of students being twelve. This

[2] Personal communication with Tsuu T'ina Education Committee, May 12, 1994

offers a number of advantages not available in the mainstream school system. There is a high degree of interaction between teachers and students. Each child in the classroom receives a considerable amount of highly-individualized attention and direction.

All teachers were adamant in stating that they did not employ any different teaching methods when working with the students. This surprising observation highlights the debate in current literature over what constitutes native pedagogy. Models derived from native communities for traditional native pedagogy stress a number of central themes or components: 1. a consensus decision making versus hierarchically imposed rule, 2. a community versus individual approach to learning, 3. holistic learning, 4. visual versus verbal orientation, 5. the loving care of children within the community structure (Calliou, 1993, Charter, 1996)

Teacher respondents identified four areas when asked about the manner in which Tsuu T'ina cultural practices are brought into the Chula School,

1. The physical location of the school on the reserve.

2. The architecture and design of the school

3. The Tsuu T'ina people in these school

4 The teaching of Tsuu T'ina culture and language

It is interesting that these teachers viewed factors such as physical location, school design and the presence of community members as some of the key indicators of culture in the school. The location of the school on the Tsuu T'ina Reserve clearly has the advantage and immediate symbolic effect of encouraging community closeness and accessibility. Physical proximity alone, however, must enhance what must already be open lines of communication which are continually reinforced between the school and community members through teacher initiative.

The great strength of the Tsuu T'ina school is the ready access to the community. All teachers mentioned that that any problems with children are dealt with through immediate contact with the parents as direct participants. The Tsuu T'ina elementary school draws on over twenty community volunteers who represent a wide range of ages including Native Elders. The presence of native individuals in the school is a strong affirmation of native culture. Parent volunteers are a strong visible presence in the classroom. Teachers also take on proactive roles with family members who are unwilling or unable to engage

directly in the activities of the school. This involves going directly to the homes of the students and attempting to solve problems in open and frank discussions.

One of the central policies followed by teachers at the school is to ensure that children are brought up to grade level with their non-native counterparts. There are a number of measures undertaken to accomplish this objective. A reading specialist teacher provides students who are behind in reading level with a strong directed program. Students who exhibit any learning difficulties are immediately referred to the reading specialist or receive remedial support. Classes taught by a Special Education Teacher are structured to meet the highly-individualized needs of the students involved.

For teachers, the level of programming commitment to Native language instruction and culture in communities like the Tsuu T'ina Reserve is always a tradeoff with the requirements of the required curriculum (Paquette, 1989: 89). Provincial guidelines dictate that formal curricula must be taught 85% of the time in elementary schools. Approved textbooks and support materials with native content are used whenever possible by teachers in the Chula School. Native themes are reflected in classroom displays. A persistent problem in cultural programming is the lack of curricular resources pertaining to Tsuu T'ina language and culture.

The development of supplementary curricula for the teaching of Tsuu T'ina language and culture at Chula School has been very much a matter of teachers finding solutions within the community. At present there is no consensus over how to write the Tsuu T'ina language and few individuals have full linguistic competence. The Chula School employs two community members as language teachers. These individuals are not trained teachers but they were selected on the basis of their knowledge of the older more traditional form of the Tsuu T'ina language. Their expertise in various aspects of Tsuu T'ina culture is acknowledged in the community. All students have one cultural class per day consisting of language drills, discussions regarding Tsuu T'ina language and the telling of legends from the past.

There are other support services provided in the school in which teachers are indirectly involved. There is a mid-morning snack provided at 10:00 am and a hot lunch every day of the week. Dental checks are provided through consultation with Indian and Northern Affairs Canada on a monthly basis. A nurse also funded by the Federal Government comes into the school on a monthly basis and maintains health records and immunization for all children. School teachers and administrators work directly with a social worker in cases

of family crisis or breakdowns. All of the children speak positively about their school as "their place." They feel a keen sense of belonging and ownership even at a very young age.

Teachers of Adults - Practices Two

The Adult Education Program run by the Tsuu T'ina Band was initiated in 1992. In 1993-1994 a total of 40 students had enrolled in adult upgrading classes. By the end of the school term, a total of 30 students were able to successfully complete the high school upgrading program (Tsuu T'ina Nation, 1994) Teaching practices in the Adult Education Program in the Tsuu T'ina Community share distinctive features with those observed in the elementary school. The structure of the overall program is based on a detailed training-needs assessment. The explicit purpose of the program is to upgrade the training and educational levels of Band members for future or ongoing employment in economic development projects in the Tsuu T'ina community[3].

Applicants come from a wide range of educational and native backgrounds. Some start at the very beginning while others may enter the program at a Grade 8 or 9 level. The Adult Upgrading Program is rooted in the community. Individuals are first interviewed before applying, then they are formally tested to determine the appropriate grade level for their enrollment. Training encompasses both traditional forms of learning such as Life Skills and new forms of academic and vocational learning prescribed by the formal curriculum guidelines .

There is an intensive emphasis on job training and career counseling with all applicants asked to prepare a career plan[4]. The program runs according to an ethos of strictness and an emphasis on whole family involvement in the education process. All students are asked to sign a memo of agreement in which they affirm they will arrive on time and attend and complete all classes. The overarching philosophy of the program is that education should be regarded as a lifelong venture. The Program emphasizes respect for students, with native teachers and administrators serving as role models.

For teachers in the program, there is an emphasis on one-on-one, highly-personalized instruction. The classroom environment is relaxed and informal. The teaching of history and politics is augmented through the development of native perspectives on events and institutions. Training and education for community self-development are intertwined as part of the operating

[3]Tsuu T'ina Nation (n.d.) Tsuu T'ina Nation Upgrading and Education Management Plan
[4]Tsuu T'ina Nation (n.d.) Adult Learning Center Application Guidelines

philosophy of the school. The emphasis is on learning as a universal need not something that is necessarily culturally-rooted. Teachers are recruited through the usual means but students are directly involved in their hiring. The learning environment is relaxed and there is immediate feedback regarding academic progress and immediate attention to personal problems.

Implications For Pre-service and Inservice Training

Innovative strategies employed by elementary Teachers and Teachers who instruct Adults in the Tsuu T'ina Community share a number of central features:

1. Early intervention in academic or personal problems
2. Education geared to meaningful employment in the community
3. A relaxed and safe environment as a precondition of learning
4. Culture present as a factor
5. Culture not the determining factor in education
6. Native role models
7. High interaction between students and teachers
8. High interaction between teachers and community

The eight features of teaching in the Tsuu T'ina community have direct implications for pre-service and in-service training in multicultural teaching. The Tsuu T'ina example most closely approximates the concept of Community-Service Learning. Teacher education in this model includes an experience-based practicum based in a given community and the identification of the social, emotional and health needs of a student population (Wade and Anderson, 1996).

Early field experiences in alternate cultural settings is valuable for altering the perceptions of student teachers but this must be done with built-in supports such as adequate monitoring and feedback, and finding quality placements. (Chance, 1996:386). The Tsuu T'ina examples illustrates that it is essential that teachers become familiar with the needs, values and educational backgrounds of students in the multicultural classroom. It is possible to consider that the physical, emotional and other needs of the student can be met by resources existing within a given community and that these resources can be brought into the school context.

The fostering of teacher competencies in the multicultural classroom during in-service training may be positively encouraged through direct participation of teachers in workshops at such facilities as the Ch[illegible] School or at the Adult Learning Center. Participation in such workshops may be an invaluable way for

teachers to determine their own needs in their professional work through positive interactions with other teachers acting in mentorship roles. The pragmatics of identifying the specific requirements of minority students and of working with a community would be greatly facilitated by such an exchange. Power bridging mechanisms could be put into place to link communities with participants in both pre-service and in-service teacher training in a community-service model which draws on the eight themes from the Tsuu T'ina examples.

Conclusions - Summary

The Tsuu T'ina examples illustrate new directions in the training of teachers for multicultural settings. The emphasis is less on the cultural component of teaching than on the self-affirmation of both teacher and student based on high interaction, (the self-affirmation of the student), purposive instruction geared to the job market and the acquisition of basic literacy skills. The creation of learning environments in which the need for safety and belonging and equity is axiomatic to such a process. (Breitborde, 1996:368) This is however a process which takes time.

In conclusion, reflections on the examples from the Tsuu T'ina community support a model of community-service for fostering cultural competencies in teacher practice. This extends the basic notion of creating a community in the classroom to that of addressing the basic needs of the student and the creation of a community-centered approach in teaching and learning. (Oakes and Quartz, 1995; Gagliardi, 1995). The process of gaining teacher competencies involves direct responsive participation in the changing needs of a community and the demonstration of teaching aimed at the mastery of meaningful skills.

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PREPARING TEACHERS FOR THE NEW MILLENNIUM: THE SCHOLAR-PRACTITIONER MODEL AT THE UNIVERSITY OF ARKANSAS

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ABSTRACT

This presentation introduces the Scholar-Practitioner Model for the Master of Arts in Teaching (M.A.T.) Program at the University of Arkansas in Fayetteville, Arkansas, USA. It includes a rationale for its development and focuses on the seven tenets of the Model, the commonalities in all the program areas, and describes the three types of partnerships involved in the delivery of the Program. It also illustrates how selective assignments in Pre-MAT courses, especially Introduction to Education, reflect the key concepts of the course and correlate with the tenets. It ends with an overview of the informal assessment of the program and previews the future directions being planned based on a refocusing and redesigning of current practices.

Preparing Teachers for the New Millennium: The Scholar-Practitioner Model at the University of Arkansas

Rationale for Change

Too often educational reform initiatives have little, if any, impact on the effectiveness of classroom teaching. Although many plausible explanations can be made for the lack of positive impact, historically those that are less than successful fail to recognize the complexities of teaching and learning, do little to improve the conditions of teaching in the world of practice, and neglect to involve practicing professionals as collaborative partners. More specifically, they are often externally-based improvement efforts suggested by educational research or mandated by policy makers.

While in some countries, national curricula exist for the preparation of teachers, this is not the case in the United States. Teachers are licensed to practice in each of the fifty states, and the standards for licensure are set at the state level. In addition, there are over 80,000 school districts who set their own criteria for hiring licensed teachers. This is further complicated by the fact that there are over 1100 colleges and universities which have teacher preparation programs. However, there is a substantial number of national initiatives that try to bring some order to this potentially chaotic system. This number includes the National Council for Accreditation of Teacher Education (NCATE), Interstate New Teacher Assessment and Support Consortium (INTASC), the Holmes Partnership, the Renaissance Group, American Association of Colleges for Teacher Education (AACTE), Association of Teacher Educators (ATE), Teacher Education Council of State Colleges and Universities (TESCU), and the National Board of National Board for Professional Teaching Standards (NBPTS), all national groups that address different aspects of teacher training, provide a forum in which there are discussions of issues, and set forth the general milieu that support the consideration of reforms. Out of the discussions in these various groups has come the formation of the National Commission on Teaching & America's Future, an organization whose primary focus is on the improvement of educational processes.

Educational renewal requires a collaborative effort among all stakeholders, especially between public schools and colleges of education. There must exist a reciprocal commitment to change, informed by theory and enlightened by

practice, resulting in professional development for in-service teachers, and authentic instruction for both pre-service teachers and school-aged learners. Neither institution will sustain change without the establishment of communities of learners where groups of individual communicate, cooperate and collaborate in order to create places where all individual will have equal opportunities for learning.

Recognizing the need to reconceptualize and redefine the roles, responsibilities, and instructional practices of teachers, in 1992 the University of Arkansas at Fayetteville restructured teacher certification programs so that students seeking initial certification must complete both a bachelor's degree program in their content area, including an 18-hour minor in education, and a Master of Arts in Teaching (M.A.T.) degree program. Consistent with (INTASC) and (NCATE) standards and a statewide initiative in Arkansas to restructure licensure levels, the College of Education and Health Professions implemented extended initial teacher preparation programs that include year-long internships in cohort partnership schools.

The Scholar-Practitioner Model

The mission of the College of Education and Health Professions is to enhance the quality of life of the citizens of Arkansas, the nation, and the world through the development of scholar-practitioners in education, health, and human services. Specifically defined, scholar-practitioners are teachers, administrators, and counselors who value theory and research, comprehend theory and practice as being complementary and mutually reinforcing, and are committed to the enhancement of teaching, learning, and professional practice. Scholar-practitioners understand the nature of a discipline and how new information is created and adopted. They also understand the context and dynamics operating in the practical world of work and how to apply knowledge to challenges. The strength of the relationship between scholarship and practice enhances and supports the continuous development and growth of the professional. As the students relate theory and practice, their knowledge of the learner and the teaching-learning process increases.

Tenets of the Scholar-Practitioner Model

Building upon the college-wide mission and the role of the scholar-practitioner in advancing that mission, the design and implementation of teacher preparation programs are based upon the following principles:

- Education prepares individuals for creative, inquiring, and enriched lives.

- Education enables individuals to form partnerships, alliances, and governments which balance individual freedom with societal needs.
- Education allows and promotes responsible stewardship of the global environment.

The expectation, therefore, of the College of Education and Health Professions is that every educator should exhibit the seven tenets of a scholar-practitioner, namely, one who:

- accesses, uses, and/or generates knowledge;
- plans, implements, and models best practices;
- understands, respects, and values diversity;
- is a developing professional and a lifelong learner;
- communicates, cooperates, and collaborates with others;
- makes decisions based upon professional standards and ethical criteria; and
- is knowledgeable about learners and learning, teachers and teaching, and schools and schooling.

Role of University/Public School Partnerships in Teacher Preparation Programs

The fundamental premises of teacher preparation programs at the University of Arkansas are that (1) teacher education programs of high quality require interlocking collaboration of K-12 school systems and university faculty in education and other colleges and (2) reform of teacher education and schooling are inextricably linked. Based upon this philosophy, the College of Education and Health Professions transitioned from traditional models of preparing teachers toward a site-based model dependent upon the collaboration of and contributions from all stakeholders. To assist with the planning, development, and implementation of a field-based model of teacher preparation, the University of Arkansas/Northwest Arkansas Partnership was formed between the College and area public school districts. Always at the forefront of partnership activities has been the increased achievement of public school students as reflected in the mission of the partnership:

To enhance the quality of life for all Arkansans by improving our schools and teachers, thus improving a child's opportunity to learn. This in turn will

create better citizens. By collaborating with community, public schools, business, and higher education, a new model is created which will be critical to answering 21st century needs. Specifically, the goal of the Northwest Arkansas Partnership will be to approach this vision through the Master of Arts in Teaching (M.A.T.) degree program.

To provide direction for simultaneously promoting the mission of the partnership and the mission of the college, partnership activities focus on four interrelated areas of concentration:

- to improve learning in schools,
- to increase diversity in the teacher force,
- to reconstruct the work of teachers, and
- to link theory to practice.

Types of Public School/University Partnership Arrangements

In collaboration with public school faculty and administrators, the College of Education and Health Professions formalized three types of partnerships. The two-fold purpose of the partnership arrangements is to (1) support and become involved in teacher preparation programs and (2) provide mutual professional development opportunities for public school/university faculty. Those three types of partnerships are *Partnership for Early Clinical experiences, Partnership for Specialized Field Experiences,* and *Cohort Partnerships.*

Partnership for Early Clinical Experiences. Sites serving as a Partnership for Early Clinical Experiences assist with the planning and delivery of freshman and sophomore level courses required of all pre-service teachers: Introduction to Education, Survey of Exceptionalities, and Classroom Learning Theory. Planning the instructional content and related field experiences is a collaborative effort among university faculty, public school faculty, and university students.

Partnerships for Early Clinical Experiences Sites serving as a Partnership for Early Clinical Experiences assist with the planning and delivery of freshman and sophomore level courses required of all pre-service teachers: *Introduction to Education, Survey of Exceptionalities,* and *Classroom Learning Theory.* Planning the instructional content and related field experiences is a collaborative effort among university faculty, public school faculty, and university students.

Partnerships for Early Clinical Experiences may involve a single school, multiple school sites, or a district. Each partner agrees to host at least one section of the above courses, with the number of field experience hours ranging from 10-30. The following chart presents an overview of the involvement of partners in early clinical experiences.

Course	Description	Sections/semester with total # of students	# Field Hours
Introduction to Education	Give students an opportunity to observe and participate in a variety of settings	7-9 sections with 30 students in each section	30 hours, including 10 hours at an elementary setting, 10 hours at a junior high/middle level setting, and 10 hrs. at a high school setting
Survey of Exceptionalities	Survey of characteristics of students with exceptional needs	5 sections with 30 students in each section	10 hours of field experiences in K-12 settings
Classroom Learning Theory	Survey of the major theories of learning with special emphasis on human learning and implications for education	5 sections with 30 students in each section	10-12 hours of field experience in K-12 settings

Partnership for Specialized Field Experiences. Sites serving as a Partnership for Specialized Field Experiences agree to host a field-based junior or senior level course. Specifically, program-specific courses in Special Education and Childhood Education are offered on-site at the partner school. Public school faculty become active participants in developing course curriculum and instructional activities, delivering the curriculum, evaluating program effectiveness, and assessing student performance.

Cohort Partnership. Cohort Partnerships assist with the delivery of the courses required for successful completion of the Master of Arts in Teaching Degree Program. Because the fifth-year curriculum integrates graduate coursework with a year-long internship, the interns are in the school setting from the beginning of the public school calendar until the day before the University commencement. Although formats differ slightly for each area of emphasis, most of the graduate courses are field-based with instructional teams consisting of public school and university faculty assuming mutual responsibility for course design and implementation.

Each of the above partnership arrangements plays a vital role in the delivery of teacher preparation courses and in ensuring that graduates are scholar-practitioners. To ensure systematic professional development, each

student's program of study begins with an early clinical experience and culminates in a year-long internship. Each course and related field experience build upon previous experiences.

Overview of Teacher Preparation Programs: Commonalities

Students seeking recommendation for initial certification through the University of Arkansas will have earned both a bachelor's degree and a Master of Arts in Teaching degree. The master's degree is a 33-hour program offered in consecutive summer, fall, and spring semesters with seven available areas of emphasis: agricultural education, childhood education, middle level education, physical education, secondary education, special education, and vocational education. While the professional educational faculty value the uniqueness of each professional education program, all programs share the following characteristics:

- computer literacy,
- classroom management,
- interpersonal skills and human values,
- reading and writing across the curriculum ,
- multicultural education,
- performance evaluation of pre-service students,
- instruction for typical and exceptional students,
- knowledge bases supporting the unit and programs,
- field-based experiences undergirding classroom instruction, and
- philosophy-driven and philosophy-generating unit and programs.

At the undergraduate level, all students must successfully complete a pre-education core consisting of eighteen hours of coursework.

Curriculum---Pre-M.A.T. Core, Program Core, Additional Courses

Pre-M.A.T.

Eighteen hours of Pre-M.A.T. courses reflect the above mentioned commonalities. The names of the courses are indicative of the effort to address these commonalities. Childhood Education, Secondary Education, and Special Education are representative of all the different areas of emphasis and are used as examples to illustrate the way by which the commonalities are integrated. The selected programs require the following curricula: 2 hrs. – *Introduction to Education,* 1 hr. – *Introduction to Education Practicum,* 3 hrs. – *Educational*

Technology, 3 hrs. – *Survey of Exceptionalities*, 3 hrs. – *Classroom Learning Theory*. In addition to these commonalities, each of the following areas of emphasis require additional program-specific courses.

- Childhood Education: 3 hrs – *Children's Literature* and 3 hrs.- *Emergent and Developmental Literacy*.
- Secondary Education: 3 hrs.- *Classroom Human Relations Skills*, 1 hr. *Seminar: Introduction to Professionalism*, 1 hr. – *Seminar: Creative and Critical Thinking Skills*, 1 hr. *Practicum: Creative and Critical Thinking Skills*, and 1 hr. – *Structure of the Disciplines*.
- Special Education: 3 hrs. – *Nature and Needs of Persons with Mild Disabilities* and 3 hrs. – *Nature and Needs of Persons With Moderate/Profound Disabilities*.

Program Core

All three programs herein illustrated have core curricula that continue to emphasize the commonalities.

- Both Secondary and Special Education have the following core courses: 2 hrs. - *Classroom Management Concepts for Teachers*, 2 hrs. - *Curriculum Design Concepts for Teachers*, 2 hrs. - *Reading and Writing Across the Curriculum*, 2 hrs. - *Multicultural Concepts for Teachers*, and 2 hrs. - *Teaching & Learning with Computer Based Technologies*.
- Childhood Education replaces the 2 hrs. - *Reading and Writing Across the Curriculum* with 2 hrs. of *Measurement/Research/Statistical Concepts for Teachers*.

Additional Courses: Fifth-Year Internship

During the 5th year, all students begin taking courses during the summer session prior to the opening of the public schools. This is followed up with courses that are taught either on-site at the public schools or at University campus locations. There are special curricular requirements for students in the three programs which they take after they have been placed in cohort groups. However, regardless of the area of emphasis, students are expected to demonstrate proficiency in each of the ten areas of commonalities as highlighted in the previous section. Each areas of emphasis requires additional courses.

- Childhood Education: 3 hrs. - *Childhood Seminar*, 3 hrs. - *Research Case*

Study in Childhood Education, 3 hrs. – *Literacy Assessment*, 3 hrs. *Readings in Early Childhood Education*, 2 hrs. – *Historical, Contemporary and Future Concerns in Childhood Education*, and 6 hrs. – *Internship*.

- Secondary Education: 1 hr. *Practicum: Writing Across the Curriculum*, 1 hr. – *Practicum: Reading Across the Curriculum*, 1 hr. – *Moral Dimensions of Teaching*, 2 hrs. *Special Methods of Instruction* I, 3 Hrs. – *Special Methods of Instruction II*, 3 hrs. – *Measurement & Evaluation*, 3 hrs. *Research in Curriculum & Instruction*, and 4 hrs. *Internship*.
- Special Education: 1 hr. – *Classroom Management Field Experience*, 1 hr. *Curriculum Design Field Experience*, 3 hrs. – *Transition Planning for Persons with Exceptionalities*, 3 hrs. – *Applied Classroom Management*, 3 hrs. – *Advanced Methods of Teaching Persons with Exceptionalities*, 6 hrs. – *Clinical Practicum, and 6 hrs. – Internship*.

Correlations Of Assignment Catalysts with Key Concepts And Tenets

One example of the way by which the commonalities are included in the curriculum is the *Introduction To Education* course which is the introductory course in teacher preparation. Course content and related activities provide opportunities for students to make decisions about whether to pursue a career as a teacher or in some other area of education.

The approach to designing assignments is to make them integrative and holistic in nature. Thus, all of the assignments for the courses in the core curricula , both pre-M.A.T. and M.A.T., are based upon the key concepts of the Introduction To Education course. These concepts are:

1) research-oriented – students are expected to be partially responsible for their education;
2) writing intensive – assignments reflect different types of writing tasks, such as reflective journals, critiques, research papers, drafts of interview questionnaires for poll-taking, position papers, etc.;
3) collaboration – during observations and interviews, students should take note of practitioner collaboration as well as be directly involved with collaborative assignments within the courses;
4) discussion of opposing viewpoints – especially for such controversial issues as school financing, religion in the schools, and curricula reflecting different societal needs, such as sex, character, and drug education;

5) critical thinking skills – problem solving activities are included in class assignments and activities;

6) lifelong learning – students are oriented to the nature of public education that embraces pre-kindergarten and continues through the adult level, along with the idea that a teacher or any other individual never ceases to be a learner;

7) diversity – field experiences enable students to perceive some aspects of the diverse society, especially, the different genders, the multi-ethnic, multi-cultural, multi-racial, multi-religious, and the exceptionalities to be found in the society;

8) information processing through reading – research papers and information needed to discuss intelligently any educational issue requires a lot of reading , reading that has to differentiate facts from persuasive partisan opinions;

9) decision-making skills – students begin to focus on this through deciding what to include in portfolios;

10) reflective practitioner – reflective journals and papers help students begin the process of not only questioning the validity of activities, but also of proposing alternative activities or alternative strategies for implementation of activities; and

11) professionalism – students attempt to identify attitudes, knowledge, skills, and behaviors evident in professional teachers.

Three examples are given below of the way by which assignments are correlated with the tenets; the assignments are listed first and then followed by the correlated tenets.

EXAMPLE 1. EDUCATIONAL ISSUES – Tenet one: One who accesses, uses, and/or generates knowledge; Tenet three: One who understands, respects, and values diversity; Tenet five: one who communicates, cooperates, and collaborates with others; and Tenet seven: one who is knowledgeable about teachers and teaching, learners and learning, schools and schooling.

This major assignment for the course revolves around current issues and concerns that are relevant to educators. This assignment combines five subset assignments by which students are assessed:

1) Professional article critiques – students summarize and critique two articles,

one written by a researcher who compiles and analyzes data, and one written by a practitioner that describes some new and innovative program, project, course, strategy, or approach.

2) Interviews – students interview individuals who may present relevant ideas, information, and opinions regarding different aspects of a selected issue. Included in such a list may be administrators, teachers, counselors, school board members, members or officers of local educational teacher organizations, legislators, lawyers who specialize in educational concerns, and personnel from the State Department of Education.

3) Polls – After checking and discussing the most recent Gallup Poll, students are given opportunities to use selected items and draft others that would elicit opinions from a randomized selection of the public at large, preferably from their home towns, regarding their specific aspect of the selected issue.

4) Group presentation – After being permitted to select 2/3 choices as a group issue, students are placed into groups based on their preferred choices. Students then meet in groups to devise tactics or strategies for researching the issues topic and finding information that will provide multiple perspectives of the issue, including its definition, the ways by which educational institutions are addressing the issue, and the pros/cons and advantages/disadvantages. Each group must present its issue in an unique manner, a clear and concise presentation that generates class discussion. To be noted, this assignment incorporates the critiqued articles, interviews and polls that were done by all of the group members. All of the group members receive the same grade for this cooperative and collaborative endeavor. In this way the group gets insight into the practice of cooperative learning and becomes aware of the fact that teacher practitioners are often called upon to work cooperatively as group or task force members.

5) Research Paper – This individual paper includes information from the articles read for the critiques, the interviews, and the polls. In addition, students are encouraged to use newspapers, television programs, popular magazines, and the Internet as other sources. The paper has to be written in the APA style.

EXAMPLE 2. FIELD EXPERIENCE – Tenet three: One who understands, respects, and values diversity, Tenet four: one who is a developing professional and lifelong learner; Tenet four: One who communicates, cooperates, and collaborates with others, Tenet seven: One who is knowledgeable about

teachers and teaching, learners and learning, schools and schooling. (Tenet six can be added too: One who makes decisions based upon professional standards and ethical criteria. This is because the interns can ask those teachers that they observe the rationale for their decisions and actions.)

This second major assignment in the course revolves around the field experiences where the emphasis is again on a holistic view of education, regardless of specific educational aspirations. Therefore, students visit and observe classes at the elementary, junior high/middle level and high school levels. They are given opportunities to see varieties of teaching techniques (they observe several teachers at each school level), classroom management styles, school environments, different learning styles, and student populations from diverse backgrounds. Due to the fact that Northwest Arkansas where the University is located is limited in diverse ethnic backgrounds , and as a part of the desire to point up the diversity of the American society, students are transported to schools within a 70 mile radius that have a more diverse population (including more Asians, African-Americans, and students from different socio-economic backgrounds) and also to schools that are participating in the "Great Expectations of Arkansas" program, which is directed by the College of Education and Health Professions, a program designed to help "at-risk" students based on Marva Collins' philosophy. Students are thereby enabled to see different educational strategies that help build self-esteem, and as a result act as facilitators of academic learning.

To put into context the field experiences as they relate to course content, the field assignment has three parts:

1) Students are required to keep a reflective journal in which they record their impressions, and reactions to their observations and limited participation.

2) They respond to a series of questions that reflect the ten classroom dimensions identified for the experience:

* school and classroom climate
* organizational structure and personnel
* resources and curricular/extracurricular offerings
* philosophy of the school and the classroom teachers
* classroom dynamics
* instructional practices
* discipline strategies
* diversity
* equity
* professionalism

3) Students write a reflective paper at the end of the field experiences in which they compare and contrast the different school settings and more importantly explain their decisions to continue or discontinue studies to prepare them for careers in teaching. They are expected to reflect back on

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their observational and participatory experiences, their conversations and interviews with educational personnel, and any other course-related activities and then determine whether their personalities and characteristics are best suited for this kind of career choice.

In another aspect of the field experiences, students may serve as tutors, either reading tutors or tutors for non-English speaking or limited English proficient students. A collaborative initiative with the Junior Service League has resulted in a program called "Fun Friends" Based in local public schools, student volunteers are then trained, oriented, assigned and monitored during their tutoring activities . This gives them a preliminary view of Tenet two: One who plans, implements, and models best practices.

EXAMPLE 3. PORTFOLIOS – Tenet four: One who is a developing professional and lifelong learner; Tenet six: One who makes decisions based upon professional standards and ethical criteria.

This last example of the multiple nature of assignments and the way by which they reflect the different tenets is the development of portfolios. Students are asked to begin the organization of their portfolios on the basis of the seven tenets, thereby reflecting their evolving growth as scholar practitioners. They are given a list of items that are required to be included and another list of potential items that may be added to enhance their work, such as annotated bibliographies in the APA style, education timelines, descriptions of volunteer work of an educational nature in the schools or community, and original and creative artistic work, such as poetry, essays, children's stories, and educational/computer games. After this course, the students are expected to continue the evolving development of the portfolios.

Other pre-M.A.T. courses build on the *Introduction To Education* course by requiring students to revisit some of the assignments that were involved in this course, for example, the drafting of a personal educational philosophy. At the end of the cohort internship year, they revisit this assignment once again. It is thusly made clear that this assignment relates specifically to the Tenet four that requires the learner to recognize that learning is a lifelong task. These portfolios are used as one of the criteria in the screening process for the formation of cohort groups for the fifth year M.A.T. program.

Placement Results for the 1997-98 Cohort

As discussed above, extended teacher preparation programs at the University of Arkansas were implemented beginning with the freshman class of

1992. Key reasons for the changes in degree programs and requirements included the need for additional content area courses, additional field experiences with sequenced activities, and increased collaboration with all stakeholders. Based upon data received from the 1998 graduates of the Master of Arts in Teaching degree programs, their programs of study have prepared them for entrance into the profession.

Of the fifty-five graduates who were eligible for initial teacher licensure in the state of Arkansas, fifty-one accepted teaching positions – forty-six in Arkansas and five in other states.

In addition to the master's level pay, the following districts are paying the graduates for one-year's experience upon successful completion: Fayetteville, Arkansas; Springdale, Arkansas; and Havana, Arkansas. The following chart presents a summary of data received.

# Graduates & Licensure for Arkansas	# Position Offers	# Without Offers	# No Info Available	% Offered Positions
58	55*	2	1	96.5%

Future Directions

1. INCREASED NUMBERS: There has been steady growth in terms of the number of students enrolled in the M.A.T. program. This growth has necessitated the addition of new partnership schools. Schools interested in partnership arrangements may submit applications to the College of Education and Health Professions for possible consideration.
2. PROGRAM FLEXIBILITY/ ELASTICITY: There is nothing static about the M.A.T. programs. Inasmuch as there is constant ongoing assessment being made by all of the stakeholders (instructional cohorts: classroom practitioners and clinicians and university coordinators , interns, administrators, prospective employers, etc.), changes are made from semester to semester. Those involved in the program perceive this feature to be a plus because it demonstrates the need to be reflective practitioners who effect change as needed.
3. IMPACT OF OUTSIDE FORCES: As the results of state and national forces that impact teacher education and preparation, it is envisioned that other changes will have to be made to accommodate new requirements. For example, emergent forces are causing changes to be made that meet new Arkansas state teacher licensure requirements and the teacher qualifications being identified by the National Board for Professional Teaching Standards.

4. IMPACT ON OTHER STATE EDUCATIONAL INSTITUTIONS: Other teacher preparation/training institutions in the state are instituting fifth year programs after learning of the success of the College's interns in terms of employment. Initially, there was some reluctance to adopt such a program for fear that graduates would find it hard to get employment if they could not be competitive with those certified teachers who come out of bachelor degree education programs.

5. DIVERSITY: There will be a continual effort to increase opportunities for experiences with diverse populations in terms of educational practices and attitudes (particularly school climate). Field experiences are expected to expand into more schools in the central part of the state where the oldest and most fully developed and implemented forms of the "Great Expectations of Arkansas" Program are to be found . Other field experiences on the planning agenda will transport students to Oklahoma for opportunities to visits schools with a high Native American Indian population. Also special efforts will be made to include more schools in which K-12 curricula have been developed under the "Kids Voting Arkansas", special curricula designed to develop awareness of the importance of citizens' voting in a participatory democracy.

6. SERVICE LEARNING: There continues to be expansion of opportunities for students to serve in the local schools, both partnership schools and other schools that are not partnership schools, as tutors for "at risk" students. However, with the steady increase in the number of Hispanics in the area, many more tutoring opportunities will revolve around the needs of Hispanic students, adults included, who need special help.

7. COMPLEMENTARY PROGRAM DESIGN: Efforts will be made to continue to design and implement programs that are complementary in nature. One realization that has become more and more apparent is that there is a new paradigm for university faculty who are involved in the M.A.T. Program. This is one where the field -based course delivery system facilitates action research that can then be disseminated as service to other colleagues at professional meetings, thereby adding to the knowledge base in teacher education/preparation/training.

Summary

Spurred on by its membership in the Holmes Group, the College started out in 1992 with review of its teacher preparation program. By 1997, as a part

of programmatic changes, its programs have been changed and are consistent with and reflect the recommendations of the National Commission on Teaching & America's Future

An informal assessment of the College's M.A.T. teacher preparation program has been done using the recommendations that were made by the Commission titled *What Matters Most: Teaching for America's Future (1996)*. Out of the five, there are two that relate specifically to teacher training institutions. The first one would require that rigorous standards be developed and enforced for teacher preparation and initial licensing.

The second one recommends that colleges and schools work with states to redesign education so that new teachers can be adequately prepared. This would necessitate that several changes, including the following, be made:

- to organize teacher education and professional development around standards for students and teachers,
- to institute extended, graduate-level teacher-preparation programs that provide yearlong internships in a professional development school,
- to organize new sources of professional development such as teacher academies, school-university partnerships, and learning networks that transcend school boundaries,
- to make professional development an ongoing part of teachers' daily work through joint planning, study groups, peer coaching, and research,

Both of these recommendations either have been or are being instituted in the implementation of the College's M.A.T. program. Teacher interns are getting rigorous training in their academic areas; standards have been upgraded as evidenced by the fact, the College's M.A.T. program has recently been approved again by NCATE, the agency that accredits approximately 500 (45%) of the 1,100 institutions that prepare teachers; teacher interns are involved in both graduate level studies and a yearlong internship in partnership schools; the University/College of Education and Health Professions is partnered with public school districts; and university professors and public school practitioners do plan, teach, and assess lessons jointly, along with doing research and making presentations together.

The College's M.A.T. reflects also the recommendations for technological skills, multicultural competence, and a strong emphasis on inquiry and reflection. This emphasis on inquiry and reflection has been cited in *Tomorrow's*

Schools of Education (1995), a report by the Holmes Group, a national consortium of colleges, schools, departments of education, education professional organizations, and public schools at 75 research institutions. "The University of Arkansas College of Education funds university/public school collaboration to study education practices. They have examined the effects of cooperative learning on attitudes of middle level students, classroom management strategies for elementary students, a parent-child take home drug education program, and field-based and campus-based methods courses on the reading orientations of prospective teachers" (p. 20). Being a member of the Holmes Group did help foster some of the changes in the College's teacher preparation programs.

Most recently (June 1997) at "Chautauqua for Improving Science Teacher Education Programs," a conference coordinated by the University of Iowa Science Education Center and funded by a grant from the U.S. Department of Education, the College's Secondary and Childhood Education teacher preparation programs distinguished themselves among colleagues from several peer institutions. The consensus among the institutional representatives was that the College's programs were not only innovative in design, but also built on appropriate conceptual/theoretical bases.

Two statewide systemic initiatives are both involved with the improvement of educational administrators as well as teacher skills and competencies. The Arkansas Leadership Academy housed within the College is a state-wide consortium of universities and businesses that facilitate training in leadership skills and site-based management. A similar strategy is used for the design and implementation of a Teacher Institute.

Both the College and public school administrators and faculty, however, are aware that there is still room for improvement in order to assure adequate and appropriate education and training for teachers for the new millennium.

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CHANGING PROFESSIONAL PRACTICE

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ABSTRACT

One of the great challenges of teacher training and preparation is to prepare teachers for a change process since the community and technology is changing so fast that traditional forms of teacher training are seen to be increasingly ineffective. A post-initial teacher training specialised course for those working in special schools and classes in Hong Kong is organised so as to recruit qualified teachers on a two year course, the second year of which is a teaching practicum. From 1996-7 intake the course has been reorganised in such a way as to entail a shift from a typical field experience practicum to an action research based professional development year.

In the 1996 cohort of 110 participants all were requested to complete a new Research and Development module of 45 contact hours. Its purpose was to develop school based and classroom action research skills in the teachers. This interim research report shares challenges and difficulties within this reform process whilst students are in the field and developing proposals. The program seeks to empower teachers and schools to change.

CHANGING PROFESSIONAL PRACTICE

Research to practice gap

It has been observed that the world of educators is divided into two camps with different but related concerns, those who are teachers and those who are technocrats (Wolcott,1977). The technocrats comprise policy makers, researchers and administrators, and, Woolcott argued, it is the technocrats who attend conferences. Researchers have tended to inform policy makers rather than practitioners, partly because of the nature of the science which informs their own practice and partly because research has been seen as largely a technical issue, objectively concerned with the technical delivery of the curriculum and education. Because researchers have attempted to render educational processes into objective and technical terms, and to subject

complex processes to careful analysis and in order to reduce the risk of participant bias, the language of the researchers has also been separated from that of the teachers. Teachers have been seen therefore as practitioners as opposed to theoreticians, and as generalists rather than specialists (Kenmis, 1988), and distanced by the language of research. It is perhaps inevitable that if researchers distance themselves from the problems they seek to resolve and avoid any participant role that there will inevitably be a gap between those who research and the practitioners; and these will require some legitimization of the value and relevance of the findings to practice.

The science in education movement rooted in the nineteenth century held the view that teachers needed to use scientific methodologies for research. Such a view was challenged by progressives such as Dewey, who argued that teachers are really students of teaching, who must reflect on their practice, learning from each other. Clearly the information to be gained by teachers is unique, either through action research or reflection in action (Schon,1983, 1987). Such a shift in the role of teacher as researcher accompanies a parallel shift in thinking about learning as active rather than passive, with the teacher central in the process of constructing knowledge, as opposed to being peripheral in a bureaucratic system where the relationship between teacher and student is seen as linear.

There has, for a number of years, been a criticism that there is a gap between research and practice (Crawford,1989; Mittler,1975) and the gap in the field of education is particularly alarming. Various arguments have been put forward to account for this gap and various solutions have been made to reduce it. Some have suggested that the research should be more applied, since teachers do not find much current research of use to them. Research has been said to be written by researchers for researchers. Even involving teachers in the process of selecting appropriate research is problematical, since the research agenda is not owned by teachers and therefore may not be seen by them to be relevant. Teachers unlike, for example, psychologists, are not generally trained to be doers of research and there are professionals who have argued that the business of research is not that of the teacher. Teachers, it is often claimed, are readers of research not writers.

In the 70s and 80s there have been a number of debates about the relationship between theory and practice in education, and action research has been promoted as a possible way of drawing the two together. Central to this resurging interest has been the development of qualitative methods

(MacDonald and Walker,1975; Parlett and Hamilton,1976). Action research aims to enable practitioners to investigate the connections between the theories which they espouse and their day to day practice. Making researchers out of practitioners clearly reduces the research to practice gap but more importantly enables practitioners to address issues in their practice which arise from their investigations.

An interesting debate (Hargreaves,1997) recently published in the British Journal of Educational Research between two well known writers in the field, namely Martyn Hammersley and David Hargreaves, highlighted some of the difficulties with the notion of practitioner research. One argued that doctors and teachers are similar in a number of important respects, both are "applied professionals" and both involve complex judgments. Both teachers and doctors are interested in what "works" and less with how and why. It was argued that doctors regularly draw upon research (their own and others) about the effects of their practice to inform and improve decisions. Teachers it was suggested do not do so with the same rigour.

Schon (1983, p50) has suggested that part of the process of making decisions involves practical experience and judgment based upon reflective practice. Schon states that the competent practitioner "makes innumerable judgments of quality for which he cannot state adequate criteria and he displays skills for which he cannot state the rules and procedures... ". Assisting practitioners to become researchers enables practitioners to improve the effectiveness and rationality of their actions. Action research can be seen as a form of participatory research aimed at improving understanding and understanding practice.

Changing forms of teacher preparation

Research into teacher preparation has had mixed results and the product - process model of teacher effectiveness research has contributed little to our knowledge (Ryan,1986 and Connelly and Clandimn,1994).

There seem to be at least two areas of considerable concern in the business of teacher preparation. The first concerns the extent to which theory in education informs practice, and the second, and not unrelated area, is the extent to which institutions charged with the training of teachers are effective in preparing teachers for their professional roles. Criticisms of teacher education establishments have argued that they are distanced from practice and too much based in theory, and some countries, e.g. UK, have increased the amount of

practicum and teacher development spent in schools and under the guidance of current teachers in school settings.

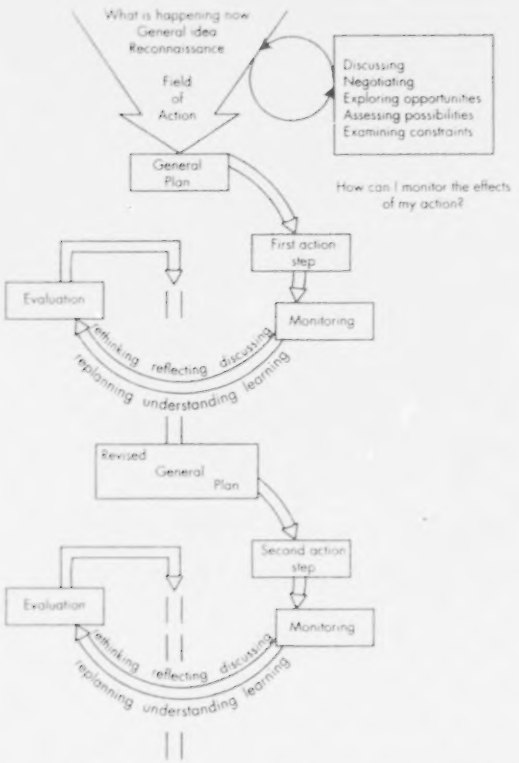
Increasing dissatisfaction with traditional forms of teacher preparation based upon the distance from recent classroom experience of college lecturers has resulted in some changes which have either required lecturers to refresh their practice by renewed experience in school classrooms and by requiring teachers in training to spend increasing amounts of time in the school setting rather than the college and under the shared direction of the teachers in school in a new partnership, or by both changes. In special education teacher preparation, particularly for segregated provision, such as special schools or special classes, training has usually been subsequent to initial teacher preparation. That is, teachers who will work with those pupils who present the greatest difficulties in learning and therefore presumably teaching, require teachers who have some experience in the ordinary classrooms and who are likely to do well with special needs pupils.

Defining Action Research

Action research, whatever its reported genesis, (and there are a number of accounts e.g Kenmis and McTaggart,1988; Anderson, Herr, and Nihlen, 1994 and Reason, 1994 and Kenmis, 1988) must acknowledge the seminal work of Kurt Lewin (1946). Lewin coined the term 'action research' and saw it as being essential in the progress of basic social research identifying its participative nature, its contribution to social change and its democratization effects. Whilst Lewin used his ideas of cycles of "analysis, fact finding, conceptualisation, planning, execution, more fact finding or evaluation" (Sanford,1970 p4) and so on in a spiral (Figure 1), the first use of the methods were in dealing with social problems. Its value in education was very quickly recognised (Wann,1953) and some prominent researchers have also seen their roles as empowering teachers to be researchers, notably Stenhouse, and Elliot (Stenhouse,1975, 1980; Elliott,1976, 1978).

Kenmis (1993) defines action research as a form of "self reflective enquiry undertaken by participants in social (including educational) situations in order to improve the rationality and justice of a) their own social or educational practices, b) their understanding of these practices and c) the situations in which the practices are carried out " (p177). The idea for action research is deceptively simple. It is an approach which aims to improve education by changing it and learning from the consequences. It is a way of enabling teachers to form self reflective groups in order to develop theory and practice

Figure 1: A Representation of Lewin's Action Research Cycle



simultaneously. It challenged the hegemony of researchers at that time (and still) in that it shifts the "subjects" of research to a position where they are the agents of change and engaged in the formulation and execution of change processes. Whilst there has been a period of "decline" in the attention paid to action research for a number of reasons (for example, Hodgkinson, 1957) the revival of interest in action research is largely connected with the development of interpretative methodologies, a need to develop collaborative curricula and a need to reconceptualise the field of educational research to include a definition of socially responsible practitioners as participants.

Preparing Special education personnel in Hong Kong

In Hong Kong qualified teachers who work in special schools special classes or resource classes, are required to take a 2 year certificate course at the HKIEd. The first year is a full time course for which they are seconded full time from their work settings, and for a further one year of part time study. In the first year a block release teaching practice of 4 weeks is organised, where course participants return to their own schools to teach their own classes. This

practicum is supervised by Institute staff and supported by the school induction teams. The second year has traditionally been a further one year teaching practice in which staff from the Institute would visit the schools and comment and supervise the practice, and, at the completion of the second year, subject to satisfactory performance, participants would be granted a Certificate. In the academic year of 1996-7 he department of Special Education set up a new Research and Development module as a core requirement (outline Appendix 1) with a view to developing a second year of professional development and action research, rather than the traditional teaching practicum.

There were several reasons for this change. First, it was recognised that course participants were generally qualified teachers with some experience in mainstream education prior to their move to special education. This argued for a reduction in the length of a teaching practicum. Secondly and importantly, there was a need to provide a new relationship between the supervisor and the student as a developing professional where the trainee teacher was required to take ownership of an area for professional development in his/her own school. Finally it was seen as a way of developing a "collective self-reflective enquiry" where teachers could improve their teaching, in curriculum development, school improvement or teaching. This meant the student identifying an area of both concern and value and entering a cycle of observation (reconnaissance), deciding on an action plan, monitoring and evaluating actions, revising the plan and possibly repeating the cycle (Figure 1). Such a selection of a plan needed to be grounded in the daily professional experience of the teacher and , in the case of the program decided by the Department team, also agreed by the school principals. The reason for this last additional condition was that the action research was seen not simply as a way of facilitating in-service education for the student but of modeling change processes to the school and of engaging in both school reform and partnership for change, with the student, the school and the training institute collaborating and pooling their resources.

Academic content and aims of the research module

One of the challenges in designing the module was to determine how wide ranging it should be. Whilst the plan was to develop skills in the students such that they could engage meaningfully in a school based project, and preferably in an action based one, there was some discussion in the Department as to the extent to which teachers should be able to read research articles and understand the more technical terms. It was agreed that students would need

to carry out a literature search and that a critical review would require students to be familiar with some statistical evidence presented in journal articles and research papers. The extent to which these skills should be taught was controversial at this level of study. Some colleagues felt that this knowledge was essential and should be included, and others thought that it should be taught as and when and if the need arose. In the event a compromise was settled for, in that some statistics teaching (a survival kit) was included. Teaching involved interactive workshop and group discussion and problem solving approaches.

Teachers in special classes and resource classes and in special schools are required to take an additional professional training to supplement their basic teacher training. This course, entitled the Course for Teachers of Children with Special Educational Needs (TCSEN), is a two year mixed mode course of one full time and one part time year. Teachers on the course must be recommended by their head teachers and meet the entry criteria. Some graduate teachers may also be appointed as teachers in these settings and be recommended for the TCSEN course even though they may not have had formal training. In the cohort under investigation almost 30 % of participants were degree holders without teacher training. The first year consists of a modular program made up of specialist, elective and core modules. In 1996-7 the intake year was required to take a new core module of 45 hours instruction in the Research and Development module in the first semester of the first year. The framework of the Module, outlined in Appendix 1, and discussed below, was designed to change the second year focus from a teaching practicum year to a professional development year. There were 110 students enrolled.

Areas of interest adopted by students

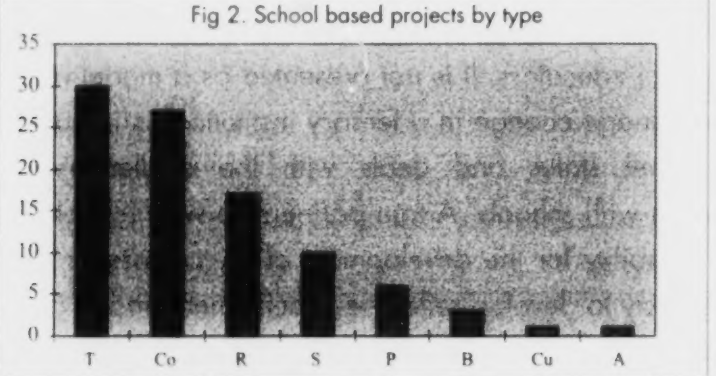
In the table of topics (Appendix 2) a wide range of interests can be observed. In all cases the topics were chosen on the basis of a three way discussion amongst the student, lecturer and the school principal, where the lecturer would be seen only as responding to suggested areas of concerns. In most cases it appeared that the students themselves had identified something of concern to them in their professional work which they wished to address. In some cases students appeared to be unsure what to research and were reluctant to review their own practice, seeking rather to collect information elsewhere to answer a general question, although related to their practice. The graph shows the distribution by topic. Teaching method (T) was the most common and that coupled with Reinforcement / punishment (R) indicated that this cohort of teachers was primarily concerned with the management of

teaching and learning. A rather miscellaneous group, called Contexts based activity (Co), comprised a range of different interests, such as preparing pupils and classrooms for integration, or making comparisons between a special class and a mainstream class in the quality and range of experiences, and the effectiveness of a sister school scheme, etc. Figure 2 shows the distribution of topics.

Difficulties encountered by staff and students

This was the first time that the lecturers in the Department had tackled the teaching of a research course in the courses for special teachers in the Institute and the first time that they were required to supervise research, as opposed to projects. The challenge of shifting to an action research mode was problematic on a number of fronts, not least because of the time scale. First, the idea of a change from a teaching practicum to an action research, even though the research was likely to be in the area of teaching, created concerns for the schools, which traditionally preferred a practicum, and were focused on teacher competency. The Department also had to move lecturing colleagues from a traditional "research" posture, from a positivistic stance, to one which was practice based and collaborative. This required staff seminar and reading materials to indicate the ways recommended and support to enable changes to occur. Any new learning will benefit from demonstration, practice and feedback, and it was felt that lecturers would feel less threatened if the projects

Fig 2. School based projects by type



Key:

T	Teaching method
Co	Context based activity
R	Reinforcement/punishment
S	Self esteem
P	Parents
B	Behaviour/management
Cu	Curriculum
A	Assessment

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were more broadly defined as class or school based rather than "action research". It was considered that the shaping of research knowledge and skills during the first year would be an important experience. Therefore, because of the difficulties and tensions inherent in any change process it was decided that action research would be defined more broadly in the first run to include a range of studies which the schools (in the form of principals) and the staff and students thought to be meaningful. A number of colleagues also felt that to devote time to action research was an infringement of academic freedom, and that students should be free to research in any educational field. In the absence of any local models already produced by staff or students and available as references it was felt that a "soft" transition towards useful research as perceived by the players was probably a more important consideration than purism in research methods.

Prospects and discussion

Just as the learner in an effective school is concerned with being actively engaged in learning and in constructing meaning, so the teacher as researcher is also actively learning. The effectiveness of these changes will depend on how well schools and colleges incorporate knowledge about learning into their practice.

This interim review has outlined a process of using an action research format to develop an action research based program in the professional training of special educators. It is not presented as a model of practice but as an attempt to manage change in a tertiary institution as it moves from college to university level status and deals with the challenges of developing professional links with schools. A true partnership with schools must recognise the dual responsibility for the development of the profession. Action research was seen as a way to develop reflective practitioners and to place the teacher in a role as agent of change rather than only the object.

Teacher preparation represents a massive financial and social investment and is increasingly to be seen as part of the context of school reform. Consequently it may be seen as a route to the restructuring of schools. Teacher education, teacher evaluation and research are inextricably linked to school, and ultimately, social reform.

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Hong Kong Institute of Education

Department of Special Education

Module: **Research and Development in Special Education**

Module description

This module is an introduction to the basic concepts of research in education, and will focus on the issues involved in reviewing and conducting special educational research. A variety of methods of collecting, displaying, organising and using information will be discussed. Students will be presented with strategies to search and locate relevant literature in a chosen area of study, and to critically review that literature. At the end of the module students will produce a proposal for an action research, directly related to their work in the classroom or school.

Objectives

By the end of the module it will be expected that student will demonstrate

1. skills to design a classroom or school based project
2. an understanding of the major issues involved in research in special education
3. skills to conduct a review of relevant sources, including the use of technology
4. a critical analysis of journals and other sources.

Mode of study Workshops, seminars, lectures, group work and library search.

Appendix 2 School based projects by type

Co	Identifying factors contributing to job satisfaction (5)
P	Parent involvement in homework
P	Parent involvement in language teaching
T	Self management to improve story writing for EBD
Co	Needs of Special School Leavers
Co	Problems faced by RC teachers (2)
R	Reinforcement strategies for SMH
T	Structured teaching (autistic)
T	Helping Problem solving for MH
R	Reinforcement strategies for Mild MH
T	Chinese input methods for deaf student
A	Profiling SOS students
T	Self recording to improve classroom behaviour of EBD
T	Leisure activities (2)
T	Learning through play in a hospital school
T	Effects of choice making on problem behaviour of EBD
P	Effects of parental expectations on student Motivation
Cu	TOC
Co	Special Teachers views of preparing skills for integration (4)
T	Using mnemonic strategies
Co	Views of special class students.
P	Improving Home - School links for parents of autistic children.
Co	Exploration of non-attendance and low achievement in a school for the deaf (4)
R	Rewards & punishments in an SOS school of reinforcement for RC students (2)
R	Token economy and EBD
P	Parental concerns for SMH pupils
R	Maths and reinforcement strategies
T	Using music therapy
T	Direct instruction on teaching reading.
T	Spelling teaching for H/I P3 pupils.
T	Cursive writing
B	Counseling re suicide in a girls school
R	Reinforcement + autistic children.
R	Use of verbal praise with SMH pupils
R	Token economy and Mod MH pupils (2)
B	Techniques for managing behavior in MH pupils
R	Reinforcement and MH
R	Reinforcement and RC pupils
T	Activity approach and mild MH (2)
T	Resource class teaching methods
T	Homework completion - strategies for Ts

Co	Comparing learning experiences of main stream & special class in one school
T	Use of role play + discussion
Co	Improving classroom strategies to make classes more inclusive (7)
S	Designing reinforcement schedules to raise self esteem (7)
T	Establishing communication strategies for EBD
T	Activity approaches with H/I (2)
R	Token economy + H/I
S	Raising self esteem in H/I
S	Raising self esteem in a RC (2)
Co	Hospital schools needs
P	Developing home-school links
R	Use of detention as a punishment
Co	Sister school scheme
R	Motivation and homework (3)
T	Facilitating friend making
T	Co-operative learning in Maths
T	Adapting PE for a CP child
T	Preparing MH for marriage
T	Improving Chinese writing skills
T	Using a communicative approach to teach comprehension
T	Use of Karaoke to improve active participation in class
B	Improving Teacher - student relationship in RC
T	Needlework and reading skills

Key:

T	Teaching method
Co	Context based activity
P	Parents
Cu	Curriculum
B	Behaviour/management task
R	Reinforcement/punishment
S	Self esteem
A	Assessment
RC	Resource classes
SMH	Severe mental handicap
EBD	Emotional and behaviour difficulties
H/I	Hearing Impairment

A Knowledge Base for Promoting Professional Qualities of Teachers and Teacher Educators

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In a changing world men and women find it imperative to extend and renew their knowledge and skills so that they can manage their lives successfully. This needs a dynamic and effective system of Education. Literature reveals that there is a pressing need in all countries for reassessment of the educational system in general and the profession of teaching in particular. Educational literature also shows that a major issue in the discussion of teacher education is the relationship between the effects of teacher education and teaching practices; that is the transformation of persons in the period of teacher education to the filling of a place in the profession of teaching.

The Purpose

The purpose of this study is to inquire and discuss the knowledge base of how to promote the professional qualities of teachers and teacher educators through substantiating the relationship between the content knowledge of pedagogy and school subject matter knowledge. To serve this purpose, three perspectives will be introduced in this paper:

1. Shulman Perspective
2. Constructivist Perspective
3. Holmes Group Perspective

Before discussing these perspectives, it seems to be useful for the purpose of this paper to define teaching profession and teacher education.

Teaching Profession

It has been argued in research literature that efforts to professionalize teaching in recent years have contrasted sharply with initiatives that, in their form and substance, deprofessionalize the occupation and the act of teaching.

In the category of professionalization are efforts to improve the knowledge base of teaching and its transmission to teachers, to ensure the competence of entrants and to create school conditions under which teachers may attend more directly to the needs of their students.

In the category of deprofessionalization, policies and practices that dilute preparation for teaching, allow unqualified entrants to be hired, and structure schools so that teachers must attend more to rules, mandates, and procedures than to the needs of students.

Professionalization of teaching is viewed, that students are not standardized and teaching is not routine. Teaching techniques should be varied and related to stages of cognitive and psychological development of children and also should be relevant to different subject areas and to different instructional goals. Teachers should avoid following standardized packages in teaching their students; they must base their judgments and techniques upon knowledge of learning theory and pedagogy, child development and cognition, curriculum and assessment; they must then connect this knowledge to the understandings and conceptions that individual students bring with them to the classroom. (Thomas, 90; Elliott, 93)

The task of teaching is not a matter of "covering the material", more importantly is to be connected with the students in different ways to make knowledge the possession of the learner, not just the teacher.

According to this view of teaching and learning, teachers must be quite knowledgeable and expert in order to make sound teaching decisions. So teaching cannot be formulated and passed down to teachers. Teaching can be improved only by increasing its knowledge base so that teachers can use it appropriately

Teachers and Experts

One should differentiate between expert teachers in a subject matter and subject area experts. Teacher education program should be designed to help pre-service teachers construct understanding of subject matter that differs from that of subject matter experts, such as biologists, historians, and social scientists. For example, a scientist's knowledge is structured from a research perspective and is used as a basis for the generation of new knowledge, while a science program should facilitate a science teacher's understanding of science from a teaching perspective so that it can be used as a basis for helping specific students' understanding specific concepts and learn conditions between similar concepts (Cochran, 1993). Obviously this is different from traditional teacher education programs that present content areas in courses isolated from the classroom context in which teachers usually teach them.

There are several kinds of understandings and skills that distinguish expert teacher from a subject matter expert. Shulman (1988) clarifies that the teacher should understand the content to be learned, and comprehend which aspects

of the content are crucial for future understanding. The teacher should also understand when persistent pre-conceptions, mis-conceptions, or difficulties are likely to inhibit student learning. He can create representations of the ideas to be learned in the form of examples, analogies, metaphors, or demonstrations. These will serve to bridge the students' knowledge and a critical concept to be learned. This conception of teaching attempts to identify the understandings and skills that distinguish an exemplary teacher from an educated pedestrian.

What is Teacher Education?

In the past few decades, teacher education has emphasized the general pedagogical methods without relating them to subject matter. Institutions of teacher education have focused on the effectiveness of general teaching methods such as teacher's use of questions, assessment of student performance, and curriculum assignment without relating them to subject matter (Cochran et al, 1993). Inexperienced teachers, for example, often rely on unmodified subject matter knowledge which is mostly extracted directly form the text, and may not have a coherent framework from which to present information.

This quality of teacher education has been a frequent target of criticism, and many people have different views about what should be done to improve it, and hold different conceptions of what teaching is like, what teachers need to know and how they can be helped to learn.

As to the definition of teacher education, many people believe that teacher education means teacher preparation, though this is one of its main functions, teacher education is meant to encompass more activities. Beside pre-service programs, there are induction programs for beginning teachers, and in-service programs for experienced teachers. However, the term teacher education program was defined by the National Center for Research on Teacher Education (NCRTE) as follows: A teacher education program means a deliberate educational intervention designed to foster learning. Teacher education programs need to be tested for effective purposes and standard. Standards for entry into and exit from the program tell us what knowledge, skills, and dispositions are considered important (NCRTE, 1988). Teacher educators, after all, have the central role in contributing to teacher education. Beside the great impact they may have on student teachers, they can also serve as purveyors of content and facilitators of learning. What they know and value and how they share this with teacher candidates contributes to the ethos of the program.

As to the teacher education content, the term content refers to the

knowledge, skills, and dispositions attitudes and beliefs that teacher educators would try to alter or influence in their teacher candidates. Content might include also knowledge of pedagogy and skills, knowledge about children, knowledge about the social and political role of education, skills in organizing and managing classrooms, attitudes toward diverse learners.

Another characteristic of teacher education program is the way teacher educators portray the relationship between their content and teaching practice and the messages they communicate about teaching, learners and learning, and subject matter. For example, is the content supposed to dictate or inform practice? Does the educator seem to view learning as the construction of meaning or the assimilation of information? (NCRTE, 1988). So the quality level of a teacher education program and its learning opportunities explain the quality of the program and its impact on teacher learning.

Though it is difficult to sort out the relative contribution of programs compared with other influences, we know that much teachers' learning takes place without programming. One of the powerful informal influences on teachers' learning is the personal experience of schooling. On the other side, experience of teaching itself is another influence on teachers' learning. Teachers have many opportunities to learn on the job.

MacGilchrist and others (1997) mention the following opportunities:

- reflecting on what happened in lessons
- asking the students their opinion of the lesson
- observing a colleague's lesson
- discussions with colleagues, other professionals, and parents.
- team teaching

Besides these informal sources of learning, teachers learn from courses in the area of arts and sciences. Such courses provide teachers with a better grounding in their teaching subjects.

Reform initiatives recognize the importance of teachers' subject matter knowledge as a function of research evidence, and that both their subject matter knowledge and pedagogical knowledge are crucial to good teaching and student understanding.

The Need for Pedagogical Knowledge to be Linked with Subject Matter Knowledge

The ultimate aim of improving teaching practices must be to improve student progress and achievement. This is very unlikely to happen unless appropriate

professional qualities of teachers and educators can be promoted through improving the quality of teacher education.

Some research evidence indicates that effective teacher education can only be obtained through a real interaction between the pedagogical knowledge and the school subject matter. The following approaches to teacher education reform emphasize the quality of pedagogical knowledge and its appropriateness to the subject matter knowledge:

Shulman Perspective

"Those who understand, teach"

Lee Shulman (1987) builds his foundation for teaching reform on an idea of teaching that emphasizes comprehension and reasoning, transformation and reflection. Here are some elaborations on these concepts:

1. Pedagogical reasoning and comprehension:

Teachers are expected to understand what they teach. To teach a lesson is to understand it, and in several ways. Teachers should understand how a given idea relates to other ideas within the same subject area and to ideas in other subjects as well.

2. Transformation and reflection:

Comprehended ideas must be transformed in some manner if they are to be taught. Transformation requires some processes as the following:

(a) Preparation of the text materials including the process of critical interpretation.

(b) representation of the ideas in the form of new analogies and metaphors.

(c) instructional selections of teaching methods.

(d) adaptations of these representations to the general characteristics of the children to be taught.

(e) tailoring the adaptations to the specific youngsters in the classroom (Shulman, 1987).

Generally speaking, Shulman's research reveals that content knowledge is basically the source of how new teachers learn to teach. They should understand structures of subject matter and its principles of conceptual organization. They also should have a set of attitudes and values that influence student understanding such as teachers' attitudes and enthusiasm towards what

is being taught and learned. Besides, teachers have to have a broad liberal education that serves as a framework for old learning and a facilitator for new understanding (Shulman, 1987). These many aspects of content knowledge are considered as a central feature of the knowledge base of teaching.

On the other hand, Shulman suggested a broader perspective in our understanding of teaching and learning. He believes that pedagogical content knowledge (PCK) should help teachers relate their subject matter knowledge (what they know about what they teach), to their pedagogical knowledge (what they know about teaching). In his search for indicators of effective teaching, Shulman (1987) observed several teachers in a research program over three years and he comments on how both content knowledge and pedagogical strategies necessarily interact in the minds of teachers and in their classroom practice. " This answers the question asked of one of us quite recently; do we teach subjects or children? ; our reflections on effective teaching suggest that we must do both " (MacGilchrist et al., 1997).

It can be concluded that the subject matter can only be teachable when the teacher is able to interpret its content and to find many ways to represent the information as analogies, metaphors, examples, and demonstration (Lee Shulman, 1988). The teacher is supposed to adapt the material to students' abilities, to their prior knowledge and preconceptions, and to tailor the material to the students to whom the information will be taught. This transformation process can be described as a continual restructuring of subject matter knowledge for the purpose of teaching.

The capacity to teach centers around the following: A teacher knows something not understood by others, presumably the students. The teacher can transform understanding, performance skills, or desired attitudes or values into pedagogical representations and actions. So teaching begins with a teacher's understanding of what is to be learned and how it is to be taught, and it ends with new comprehension by both the teacher and the student. But teaching must properly be understood to be more than the enhancement of understanding; there are some other functions that can be outlined into categories of knowledge. These categories represent the knowledge base of teacher understanding needed to promote comprehension among students. Among those categories, pedagogical content knowledge is of special interest because it identifies the distinctive bodies of knowledge for teaching (Shulman, 1987). The following are the category headings of the teacher knowledge base:

- content knowledge
- general pedagogical knowledge, with special reference to the broad principles and strategies of classroom management.
- curriculum knowledge, with particular grasp of materials and programs that serve the teacher in his teaching.
- pedagogical content knowledge, representing the blending of content and pedagogy to form the province of teachers and their professional understanding.
- knowledge of learners and their characteristics.
- knowledge of educational contexts; classroom, governance and finance of school system, communities and culture.
- knowledge of educational ends, purposes, and values.

The Constructivist Perspective of Pedagogical Knowledge

The Constructivist perspective owes much to the work of Piaget (1970, 1977), and his colleagues of the Genevan tradition. Lerman (1989) clarified this perspective by saying that knowledge is actively created by the knower and not passively received from the environment. He added, teachers and students construct together their own world and this learning results in a coherent and fruitful path by which they can adequately function (Cochran et al, 1993).

Constuctivists seem to oppose Shulman's distinction between content knowledge and pedagogical knowledge maintaining that all knowledge is pedagogical in varying ways. Constructivist educators believe that knowing is created rather than transferred, and teachers have to understand how students construct and use their understandings. So, the more a teacher understands about each student's understanding, the more effective teaching is likely to be. It is important, therefore, that staff development is necessary for pre-service program faculty in both subject matter and pedagogical fields to be able to demonstrate and reflect upon uses of pedagogical knowledge in their own teaching. University faculty members must understand the nature of pedagogical content knowledge (PCK) to foster its development in teacher education students and to enrich their own teaching. For this reason, constructivists emphasize the significant role that teachers' understandings of their students play in teaching, taking into consideration that the constructive

processes of knowledge growth and transformation occur in a social context as a result of interpersonal interactions. This must apply to teacher preparation in the sense that good consideration should be taken to the context in which the development of understanding of teaching occurs, and so learning must be situated in a context like the one in which these understandings are to be used.

Continuous integration of learning is another aspect of the constructivist perspective. It is an idea derived from the equilibration theory of Piaget. Constructivists believe that there has to be a constant equilibrium gradually established between the parts of the subject's knowledge and the totality of the teacher's knowledge. There is a constant differentiation of the totality of knowledge into the parts and an integration of the parts back into the whole. As teachers learn about teaching, they continuously integrate each experience with everything they understand including understandings about teaching (Cochran et al., 1993).

An Expanded Constructivist View of Pedagogical Knowledge

Given the constructivist perspective presented above, a group of researchers (Cochran; DeRuiter; King, 1993) from the University of Northern Colorado proposed a modification of PCK based on constructivist view of learning and its application to teacher education, and thus they added two other components to the context of teacher education; in addition to Shulman's pedagogical content and subject matter content, Cochran and her colleagues added the components of student characteristics, and the environmental context of learning. According to this broader perspective, the definition of PCK emphasizes that teachers must develop their pedagogical knowledge and subject matter knowledge in the context of teachers' understanding of students and of the environmental context of learning. The first component deals with students' abilities, ages, attitudes, motivations, and prior conceptions of the subject they are learning. The second component deals with the teachers' understandings of the social, political, cultural and physical environmental contexts that shape the teaching-learning process.

These two aspects are important for teachers to understand the bases for teaching. Pre-service student teacher is the learner, and so PCK must develop in contexts similar to classroom environments. Teachers can learn best about students by working directly with them because live teaching permits the direct interaction which shows ideas in use and opens ways to understanding. When teachers work directly with their students a good opportunity can be provided for both teachers and students to realize whether their knowledge is useful, relevant, and viable.

The four components of the new expanded perspective of the PCK are viewed to be theoretically integrated and they are so interrelated that they no longer can be considered separate. These integration processes should result in conceptual change to the point that the resulting PCK is distinctly and qualitatively different from the types of understanding from which it was constructed (Cochran, et al, 1993).

In the case of teacher education programs, the four components should not be acquired first and then somehow put together, but rather preparation programs should promote integration by having teachers simultaneously experience the PCK components. So the terms synthesized and integrated characterize the development of PCK. " The expanded definition of PCK is more than a new type of content knowledge. The integration of the four components comprises PCK. Furthermore, the transformation is total in that it occurs simultaneously in all four components as they become integrated to form PCK " (Cochran, et al, 1993). However, the relative contributions of the four components to PCK development will vary according to the nature and the order of the courses and field experiences. For example, the initial hours that pre-service teachers spend observing in classrooms should foster development of their understanding of the school context (PCK component) more than their understanding of subject matter (PCK Component), while the first attempts of new teachers at teaching difficult subject matter concepts may contribute to their development of subject matter understanding and understanding of students.

Cochran and her colleagues suggested a series of hypotheses that help in applying the pedagogical content knowledge and how it might be developed through teacher education programs. These hypotheses can be abstracted as follows:

1. PCK development requires conceptually integrated instruction across liberal arts, pedagogy and subject area courses.
2. PCK development in teacher preparation program may depend on the grade level focus of those programs.
3. The construction of PCK results from multiple opportunities to teach, to observe, and to reflect on one's own teaching and that of others in a content area.
4. Because of its integrated nature, PCK development cannot occur only in a separate course such as a capstone seminar. The development occurs

through repeated experiences that promote simultaneous learning of the components.

In conclusion, the PCK model may serve as a Framework for providing pre-service teachers with a coherent and integrated set of skills and understandings of teaching. The delivery of such programs requires the cooperation of pedagogical experts, subject area specialists, and experienced teachers.

A teacher prepared in these programs might then be able to say:

"I understand, therefore I teach. I teach, therefore I understand" .

Holmes Group Perspective: School-Based Knowledge of Pedagogy

Teacher education which is based mainly on schools has been introduced by Holmes Group. They are a group of educators who believe that it is hard to create descent preparation programs for teachers without offering them the opportunity to spend substantial time in schools that demonstrate exemplary practices. For this reason, at the second annual meeting in January 1988 Holmes Group leaders called for a major commitment to creating schools in which university faculty and experienced teachers together pursue research on new teacher preparation. As a result, the Group suggested a consortium of universities and schools to create the so called "Professional Development Schools", schools that function like teaching hospitals. Through seminars and dialogues, Holmes leaders emphasized the fact that creating a true profession of teaching requires coalitions and alliances between universities and schools.

Schlechty (1988) described the professional Development Schools (PDS) by saying: "What distinguishes PDS from others is not their exemplary status, but their dual mission of providing exemplary programs for students while providing for the systematic induction of new teachers and administrators into schools".

He added that it is not enough to identify exemplary schools, the real challenge is to invent them. The exemplary schools can be invented in three main steps:

1. To develop beliefs and standards that describe what an exemplary school looks like and how it functions.
2. To develop a means of assessing schools in the light of those beliefs and standards.

3. To design training and development activities that will help these schools move towards the standards. (Lanier et al, 1988)

Learning is viewed as an active process in which students are participants, not merely passive recipients of information. The teacher's function is to create conditions to motivate students and to assure that students have the instructions and support they need to work successfully.

However, Holmes Group strongly believes that the reform of teacher education depends on changes in ordinary schools. The Group contends that the best teacher education program will not make much difference if its graduates find themselves in schools where they are not treated as professionals. They added that ordinary schools will have to become places that nurture the growth and development of teachers, and Holmes work cannot succeed without strong allies among classroom teachers and principals, who are, after all, the real profession of education.

Conclusion

Literature of this paper shows that effective teacher education should provide school system with teachers of distinctive qualities and abilities. The ingredients that make a teacher education program distinctive are a key to building a knowledge base that supports the design of program content. The knowledge base for a program can be developed when the faculty members of that program collaborate to help in building structural unity of its courses and experiences. This collaboration offers prospective teachers a clear vision of their professional roles in schools.

Along with this line, teacher education programs need to develop a source of beliefs about the purpose of schools and the role of teachers, including educational philosophies, theories, research, and social perspectives. They also need to develop a source of beliefs about teaching practices (Galluzzo, 1993). For example, in a recent analysis of a reading instruction, it was argued that the purpose of reading instruction should be to mold a pupil into a reader and not simply into someone who can read.

Research of teaching is another source of beliefs. Research may contribute to teacher education by suggesting, for example, that how time is used in the classroom is an important variable in student achievement. Teacher educators who value this research can provide teachers with a foundation for making decisions about the efficient use of time in classrooms.

The major objective of this paper was to show that distinctive professional

qualities of teacher education graduates can only be obtained through real interaction between the pedagogical content knowledge (PCK), and the school subject matter knowledge. To serve this objective, the paper discussed three perspectives: Shulman's, Constructivist's and Holmes Group's perspectives.

Shulman's perspective basically emphasized the importance of content knowledge as a source of how new teachers learn to teach, and to understand structures of subject matter. He thinks that teachers should have a set of attitudes and values that influence students' understanding. Teachers should have also a broad liberal education that serves as a framework for old learning and a facilitator for new understanding.Shulman builds his foundation for teaching reform on an idea of teaching that emphasizes reasoning, transformation and reflection.

Constructivists oppose Shulman's distinction between subject matter knowledge and pedagogical knowledge maintaining that all knowledge is pedagogical in varying ways. They believe that knowing is created rather than transferred, and thus teachers have to understand how students construct and use their understandings. These constructive processes of knowledge growth occur in a social context as a result of interpersonal interactions. For this reason Cochran and her colleagues added the other two components to the context of teacher education. In addition to pedagogical knowledge and subject matter knowledge, they added the components of student characteristics and environmental context of learning.

The model of "Professional Development Schools" was created by the Holmes Group to show that teacher preparation and realities of teaching are one process and cannot be separate. Holmes leaders emphasized the fact that creating a true profession of teaching requires strong coalitions between universities and schools. They also emphasized that ordinary schools should be promoted to become places that nurture the growth of teachers, maintaining the strong belief that the best teacher education program will not be effective if its graduates find themselves in schools where they are not treated as professionals

Generally speaking, the main theme of these perspectives is how to remodel teacher education and promote its programs to a degree of producing graduates with distinctive professional qualities. They all call for strengthening the links between teacher education programs and teaching practices, and oppose the traditional programs that present courses isolated from the classroom context.

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Building School-University Partnerships In An Age of Change

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Building School-University Partnerships In An Age of Change

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Partnerships between individual university tutors and school teachers are not new. This is hardly surprising, since many teacher educators have their roots in schools and most teachers have been trained in universities. There is, therefore, an affinity of moral purpose and complementarity of practice, (Day 1997). Paradoxically, this is sometimes accompanied by a scepticism by school teachers of the theory bound esoteric world of the academic which contrasts with the perceived practice bound action worlds in which they work. However, the nature of 'partnership' has been changing over the last decade, partly as a direct result of educational reforms which have altered the balance of knowledge power as the usefulness, rigour and relevance of university research has been called into question and universities have been forced to compete for custom as their own standards of research and teaching have come under close finance led, ideologically determined public scrutiny. Partnerships of the past have usually been located in:

(i) the supervisory/mentoring relationships between tutors and teachers in pre-service programs.

The traditional 'right' of university tutors to carry primary responsibility for standards and assessment has been challenged in recent years by, for example, the development of apprenticeship models of predominantly school-based teacher education, external quality inspection, nationally imposed ITT curricula and categorical funding in a number of European countries, and the development of Professional Development schools in USA. These reforms have caused a crisis of identity for teacher educators who have had to renegotiate contracts in a world of purchasers (schools) and providers of services (universities), and who are having to learn to cope with different imperatives.

(ii) the 'provider led' relationships between teachers and universities in which the latter offer a 'smorgasbord' of modularised award and non-award bearing in-service teacher development programs.

Here, too, roles have changed, with teachers as 'clients' now participating indirectly and directly in the content and process agendas of programs, often dictating the timing, times and places of meetings.

(iii) research and development relationships between university tutors and the education community. These may be sub-divided as (a) pure research in which university scholars alone were deemed to have the technical expertise necessary to generate knowledge about teachers, teaching, learning and schools; (b) applied research in which university scholars led others in curriculum and staff development projects; and (c) collaborative research in which university researchers worked alongside teachers in order to generate 'grounded' knowledge alongside needs identified by the teacher participants themselves.

This later role survives, largely because it was, and is, based upon the consonance of individual value systems of tutors and teachers, is essentially of direct practical benefit to individuals and organisations, and occurs within negotiated ethical frameworks. However, leadership and control of the 'applied' research agenda is being strongly contested by government (eg in developing national curricula, within this delegating to schools the responsibility of producing annual school development plans and monitoring and evaluating these, 'tendering' through its agencies for development or evaluation of particular programs; or by focusing available funding upon issues of its choice). Furthermore, governments throughout the world are demanding that educational research results contribute more visibly and more directly to measurable improvements in teaching and learning in schools.

This brief analysis suggests the need for a systematic reassessment of purposes and roles, and there is evidence that this has been happening worldwide with the growth, for example, of 'School Improvement' movements generated initially by university tutors acting in collaboration with schools, school-university partnership committees; collaborative action research projects; and school-university learning consortia or networks (Huberman, 1995). As yet, however, there have been few systematic attempts to 'map out' the territory for teacher and school level development and change in relation to the sustained strategic roles which universities may play. For example, with regard to networks in North America which engage school-based educators in their own learning:

'Much of what we know is anecodotal or drawn from studying single networks that have their own particular context and purpose'.

(Lieberman and Grolmich, 1997, p.193)

The MILJON project, so called because of a grant of one million Krona provided by the Swedish Ministry of Education annually over a period of five years, is one such attempt to address this gap. It was established at a time when school and university systems in Sweden had been subject to sweeping government reforms. It was implemented during what might be regarded as the first phase of transition of teachers and schools from the old individualistic culture to a new goal-focused collegial development culture. The reforms of the school and university systems like those in many other countries were not synchronised. The crucial role of in-service teacher education in a nationally imposed localised school management system was hardly addressed. Whilst the government appeared to have recognised it as, 'the most important instrument to influence teachers' work' (Kallös and Selander, 1994, p.246) it is still not compulsory, and responsibility for it under the new legislation rests with the municipalities (Swedish Ministry of Education and Science, 1995 p.16). In other words, teachers can no longer rely upon the State to provide in-service maintenance and development opportunities.

The reform of the school system, as in other countries, created an imperative for teachers in schools, their Principals and local politicians to review the purposes of schooling and teaching, the means by which the curriculum was managed and taught, and the way in which teachers were supported in this. The reform of pre-service teacher education which brought together two 'distinct' teacher education traditions into one program – the training college 'craft' tradition and the university 'academic' tradition – provided the challenge of integrating the different agendas of academic-researchers and teacher educators. Within and between the reforms, however, there is potential for disenchantment and disharmony.

The importance of the MILJON project and its contribution to knowledge about effective school-university partnerships was that it provided opportunities for exploration of relationships and points of contact which enabled these different individual personal, social and systemic biographies to connect, explore and share visions of 'good' schools, 'good' teachers, and the means by which both might be challenged and supported by the academy. Its cluster of seven research and development projects provided an ideal empirical opportunity to investigate the potential for the development of different kinds of partnerships within the reform rhetoric of government and the reality contexts of school teachers and university staff.

The Projects

The review data were collected by means of a series of interviews and site visits, over two periods of eight and five days respectively with a one year interval, with the MILJON project directors and manager, the individual project leaders and/or field officers, and teachers, headteachers, students and student teachers who participated. These were opportunity samples selected by the project leaders. All interviews were tape recorded and transcribed. These transcriptions formed the empirical database, together with written descriptions provided by the project leaders, and other documentary information relating to the Swedish school and university reforms. Each interviewee was assured of anonymity and project leaders were not present whilst project participants were interviewed. On average each interview lasted 45 minutes, and the interviews may be described as open and semi-focused with the interviewees being encouraged to discuss the project according to their own constructs, in relation to the project's stated purposes and their own professional development agendas. The prime intentions were to a) generate issues for consideration by the participants in the project which would provide stimuli for further reflection on purposes, practices and outcomes and, where appropriate, new planning and action; and b) to provide knowledge to the broader educational community regarding the effectiveness of different kinds of school/teacher/university partnerships.

Two of the seven research and development sub-projects had already begun prior to the MILJON project being founded, and five were developed as a direct result. Although all concerned 'partnership', they represented different concepts, had different purposes, and were conducted in different ways according both to these and the particular biases of the project directors.

The different development agendas which were addressed by each of the sub-projects are represented in Figure 1 below:

Figure 1 Project Development Agendas

1.	BALIL Project (BP) (Children's interpretation of life)
Leaders	2 University Teacher Educator/Researchers.
Purposes	'To encourage cooperation between student teachers and teachers which will encourage school-based development and influence the minds of student teachers...'
Participants	6/8 teachers and student teachers.

Data source	2 mature student teachers and 2 project leaders
Focus	Series of 7 researcher led seminars on how children look upon their lives.
Source of idea	Research interest of university researcher.
Project initiation	Pre-MILJON Project.

'The subject of our seminars was children's conceptions of life. About 50% of teachers who attended came from the same school... only those who adopted our ideas came...'

This project had begun prior to the inception of the MILJON project itself, and continued after its end. Like the Local History Project, and LARPRO, the research program which formed the foundation for the in-service seminars embodied the interests and beliefs of university researchers. Essentially, it was a vehicle for sharing educational values. Teachers were, then, invited (co-optation) to join the university researchers in developing and disseminating their project. 'Our plan from the beginning was to produce materials for in-service...' For its success, then, the project required participants whose educational values coincided or at least converged with those of the researchers, and, within this, who were interested in exploring further the thinking that underpinned their practice, '...theory hungry teachers who are saturated with practice, eager to get theoretical views on their subject, on their future work...'

An important strand of the project's strategy for developing and disseminating the ideas of its originators was to use the work of student teachers to involve teachers:

> 'During the last year, I had a group of student teachers who did their teaching practice in the same school, so I was able to meet their teachers again... They said that the result of the seminars had not been any big work projects, but they themselves had got new ideas on how children think and how to develop their thinking... So it was a very small, local effect...'

The researchers themselves were 'traditional' academics who worked mainly outside the schools.

2. L.A.R.P.R.O. (Professional Development Among Teachers by Clinical Supervision)

Leader	University Researcher, assisted by Research Field Worker and Colleague.
Purposes	'To give support to teachers who are interested in professional development through clinical supervision in groups... to study the supervision process concerning important aspects, such as leadership, group processes, communication, personal and collective defences, written or verbal contracts and... the core content of the communication... to develop professional language.'
Participants	2 schools (one with teachers from junior level, one with teachers from senior level). Each group met 8 times every three weeks, observed by field worker, led by university person acting as facilitator to discussions.
Recruitment	Opportunity groups. Schools know the researchers.
Data source	Project field worker, leader, colleague acting as consultant, 8 teachers.
Focus	Different kinds of supervision as a means for professional growth.
Source of idea	Project leader
Project initiation	MILJON Project.

> 'Teachers are really in need of clinical supervision... because there are always situations with students or colleagues that are really disturbing in one way or another... and it's good to have someone to talk to...'

The teachers in one of the two project groups had all opted into the project which had been proposed by the university. They had wanted assistance in discussing issues of importance to them, and although surprised at the 'process' non-expert role taken by the facilitator of the ten two-weekly one and a half hour group discussions, with one exception, were satisfied with the result. It had been an opportunity which otherwise would not have been available in the press of school life. They were from different subject areas and were already reflecting individually on their work as professionals, had all taught in

the school for more than seven years, but nevertheless felt 'isolated'. The school culture – in their perception – was one in which the sharing of problems was perceived to demonstrate weakness.

The result of the work was a perceived increase in mutual trust and self image among the members of the group. They claimed that their work together had given them more self confidence and more confidence to express themselves in other staff settings. There was no perception among them that they had changed in any way, but rather that meeting as a group had allowed a release of tension. They had not continued to meet following the project end.

3. Centre for Local History Project (LHP): developing curriculum materials

Leader	Manager of Centre for Local History
Purposes	To answer the question, 'How can the university help teachers to use local history in their teaching? To try to get pupils to work with their local history'.
Participants	Four groups of teachers in different levels of schooling. Individual meetings, funded release from school, interviews with participants by researcher.
Recruitment	Selection by Project Leader of teachers with shared teaching philosophy from personal contacts.
Data source	2 teachers in different schools, 1 school student, 1 project leader, 1 researcher from university.
Focus	Assistance with teacher research, preparation for dissemination conference, pupil research based upon teacher preparation of research resource packs.
Source of data	Project leader
Project initiation	Pre-MILJON Project

'I didn't change... I was working in this way before... Time was very important...'

This project was materials-centred and involved six or seven teachers who were known by the Director of the Centre for Local History to be committed to a resource based research project approach to teaching and learning for pupils in schools. The project was thus, like BALIL, ideologically driven, though

in this project the teachers were able to translate their own chosen themes into practice through the construction of resource packs. The two principle perceived virtues of the project were that (1) it provided time and expert support for teachers to develop local history resource packs and projects; (ii) these were able to be used immediately by teachers and pupils in schools. Benefits to those involved were, therefore, tangible and immediate. Once produced, some of the resources was disseminated through exhibitions in schools and libraries. Whilst the teachers met occasionally, no attempt was made by the project leader to establish a network of collaboration between them. Instead, he worked alongside individual teachers as an 'expert other' in planning the curriculum.

4. RUDIS Project (How to use computers in teaching Social Science, History, Geography and Religion)

Leader	Secondary school teacher.
Purposes	'To improve teaching, especially student teachers... develop the connection between teacher training and school, that students have something to give to teachers...'
Participants	2 Social Science teachers and 2 student teacher volunteers (close up), 7 others at a distance.
Recruitment	By leader, of personal friends.
Data source	1 Teacher, 1 Principal, 1 Student teacher in one school, 1 project leader
Focus	As in title. Meetings, visits for discussion, computer networking.
Source of idea	Directors of MILJON Project.
Project initiation	MILJON Project (1994)

This project, which provided support for classroom innovation of computer assisted learning, had been directed by a school teacher.

> 'School needs somebody like me... For example... one of the main problems for teachers in primary schools is that they don't know what goes on in other schools or the university... They feel that somebody is interested... they know that I will push a little, that I am a sort of 'web'...'

One the funding had ended, his work had not continued. Although he had continued to contact the teachers with whom he worked, he had not actively worked with them. He had, however, as a result of the project, produced a guidance book for student teachers in the use of computers in schools, and, because of his work as a teacher in a 'Gymnasium', was able to observe that students from the schools in which he had worked with teachers in developing the use of computers to enhance their teaching, possessed a higher level of computer knowledge than those from others. He also claimed that:

> 'There are things happening. More teachers in the schools are using computers in their lessons than previously...'

Additionally, he had held several meetings with pre-service teacher educators but identified continuing problems of interest and isolation:

> 'He is trying to use computers now, but he feels now that he is in the same situation that I was when I worked at the teacher training school, that he is quite alone...'

He was concerned, too, that, 'nothing is happening in teacher training schools' so that the professional knowledge of teachers was outstripping that held by teachers in universities. Whilst his commitment remained high, he no longer had the time to create or sustain the aims of the project, 'to find teachers who are interested in using computers and share experience, information with others...'

5. The School Development Project (SDP): the researcher as provider in supporting the perceived development needs of individual teachers

Leader	1 Teacher Educator (recent recruit from school)
Purposes	'To listen to what the teachers say they want... its' very important not to come with my proposals... to fix the programs of in-service for them... to work in a closer way with the schools in the area'.
Participants	Three schools (Leader previously worked in one).
Recruitment	Self selecting, from 3 neighbouring school sites, c.12-20 teachers.
Data source	7 teacher interviews (2 from each school) and Project Leader.

Focus	To provide in-service courses based on expressed needs of project teachers.
Source of idea	MILJON Project Directors.
Project initiation	MILJON Project, August 1994.

> 'It has taken two years to get the teachers to take responsibility for their own further education... it takes time to get them to understand... because most of what they do comes from the top...'

When this teacher-centred project began it was, 'the best thing that happened in the school for a long time'. It was, according to the project leader, 'the first time ever that someone had listened to the teachers and arranged courses for their further development'. This was confirmed by teachers, who claimed that, 'we have discovered that we can have some influence over our own education – it felt good'. According to the project leader, however, more time was needed ('perhaps two or three more years') to achieve synchronisation through working with the school in development planning which would resonate with individual teacher needs.

The most successful work had been with teachers of the 7-11 year age group (the leader's own experience was in this group), but the project leader was unhappy with the response of others and with the learning outcomes. Most (about 66%) of the teachers had participated in information technology courses, but, despite this, he believed that teachers in the area were at a very early stage of computer use in the classroom relative to those in other parts of Sweden.

In planning for future work, the project leader spoke of the need for a designated senior teacher in school to spend more time working alongside teachers and groups of teachers, engaging in dialogue which would provide challenge alongside support and involve sustained follow up. However, he acknowledged the difficulties faced by school principals who were unaccustomed to taking direct responsibility for the further education of teachers in their schools:

> 'The head's responsibility is for the further development of teachers, but the economy takes all of their time, so there is a need for a teacher in every school who can walk around, listen to the teachers, find out about their professional development needs, and arrange for these to be met'.

He was, then, proposing the establishment of a post of special responsibility for the further education of teachers in each school.

6. The Principals' Project (P.P.): The Researcher as Consultant

Leader	1 ex-Principal, ex-School Superintendent, currently MILJON Project Manager.
Purposes	It's very important to work together, share experiences, reflect; it's important to support the Principals... the Principal is the pedagogic leader... they have been marginalised... the only feedback the principals have from the local community... is how they are managing finance... no-one cares about the pedagogical leadership'.
Participants	3 school Principals.
Recruitment	From three schools in SDP project.
Data source	3 Principal interviews, 1 project leader.
Focus	Principals' concerns, monthly meetings.
Source of idea	University/MILJON Project Manager.
Project initiation	MILJON Project

> 'It's necessary to give people time to talk, to reflect, to have opportunities to read, discuss what they read, and to transform this into action...'

The focus of the work had been upon meeting the needs of the principals to reflect upon their roles, to revisit their values, and 'to think about the future'. This was achieved through discussion, input from the project leader who was herself a former principal and schools superintendent, the use of visiting academics from the university, and selected readings. One part of the work of this small group of three principals had focused upon the design of new school buildings, and the project leader had been able to act as an advocate in this for the principals in discussions with local politicians and teacher unions.

7. The School Network Project (SNP): research and development in a group of schools

Co-leaders	1 School District Headteacher Consultant, 1 University Teacher Educator

Purposes	'To try to get a better connection between the university and its surrounding schools. It's very important to open the doors between the university and the districts around... The university should be a generator in the school's life, and not at a distance... it's important for schools to connect with research...'
Participants	Originally 13 schools in two district networks (reducing to 4 primary schools in one district).
Recruitment	By personal contacts and existing Principals' Network.
Data source	3 Headteacher interviews in schools in one network district, 2 project leaders.
Focus	To educate three or four teachers from each school to be 'peer of project review' consultants, 'to look at things that the neighbouring schools want, to hold a mirror for them...' through regular network meetings.
Source of idea	Suggestion by leaders at a 'Network' Conference.
Project initiation	MILJON Project.

> 'The schools themselves must decide on the focus and how they want to carry it out. So the university become more of a resource. Most of the work was generated by their questions...'

The original network of thirteen schools had become a tightly focused group of four primary schools committed to working together. Three or four teachers from each school were centrally involved in inter-school peer observation for self evaluation, having received training from the two university-based project leaders who acted as 'trainers' and network coordinators during the project which ended with a two-day intensive network conference, a time for review and reflection. One indicator of success was that they had decided to continue beyond the project:

> 'They want to go on with the evaluation of their work... we met the four principals just two weeks ago. They think that as a result of this project they have a very big new project about language teaching, sharing teachers between schools, and they have never done that before...'

Each project provided a variant on the role of universities in supporting teacher and school development. The leader in RUDIS was perceived, 'to know

a lot about computers... providing ideas of how to work...' RUDIS had provided an innovation expert and networking role. Similarly, the LHP had provided money and expert assistance which had enabled teachers to buy materials and take time out of school in order to build research resource packs for their pupils to use in inquiry based projects. In doing so, it had provided a much needed practical support role:

> 'you can break the wall between the university and school. It's very important that we can use what we're doing up at the university... and those who work at the university will be more useful if we can use what they are doing... What they are working with often stops with them... and it's a very closed type of people who read what they do and are interested in what they do... They have to open their doors and work in another way, more for ordinary people...'

The SNP project provided the best example of the university and municipal personnel in partnership consultancy roles:

> 'The approach from the university is important, not to be 'the big brother'... It's the personal approach that is very important... They give us the opportunity to talk to people who are doing scientific work, studying at a higher level than we do the way we teach and how to change... it's important to know the outer world, how it works outside the school;...'

Almost all the projects involved forms of interaction between teachers. Some involved only teachers (LHP, SDP), others only Principals (PP), others Principals and teachers (SNP) and others teachers and student teachers (LARPRO, BALIL, RUDIS). The importance of expressing, communicating, receiving others' experiences and discussing these as a means of combating isolation and adding to their personal practical knowledge was raised by almost all those interviewed:

> '... we need the contact with other schools to learn from each other... It gives us ideas that we can perhaps implement... Sometimes it's like a mirror... sometimes like a window out to other kinds of teaching...' (SNP)

> '... if teachers have a network they won't be bored. They will get new, interesting ideas from other people... We need more contact to find out about research...' (SNP)

In the BALIL project, student teachers and teachers from different phases of schooling came to the Seminars, in part, in was claimed, '... because they want to discuss questions of children's beliefs across different levels'.

Different kinds of networks were established, ranging from 'close-up' learning links, as in RUDIS, through one-to-one consultancy in which curriculum plans were discussed by teacher and project leader and conferences for local teachers and the establishment of an 'inner circle' of highly committed teachers (as in SNP), to joint writing between school and university teachers and national conference (as in LHP). The SDP and SNP projects were able to establish new task-related networks within existing social site based school networks of teachers. In LARPRO, in the 'research' circle project, teachers from different schools discussed a research article related to their interest:

> 'At first it was very difficult. After a while they became acquainted with the text. They said, 'Every teacher ought to do this regularly... ' It was very important for them to meet with teachers from different worlds...' (Project Leader)

Analysis of the projects illustrated the importance of each phase. For example, key issues in the effective initiation phase of the projects concerned Agenda Setting and Biography and the kinds of Intervention strategies adopted.

1. Agenda Setting and Biography

The control of the agenda of the work related to the kinds of relationships established in action between university, teacher and school; and together these determined the benefits. Figure 2 shows that whilst all sub-projects were of value, those which focused upon either negotiating or matching teacher and school identified need were of more direct immediate benefit than those in which the researchers' agenda dominated. The knowledge generated by those projects contributes more directly to knowledge about education and thus benefits primarily a particular sector of the educational community, ie researchers and teacher educators.

Figure 2 Location of Benefits

Benefits	BALIL	LARPRO	SNP	SDP	PP	LHP	RUDIS
Direct benefit to University		✓	✓				
Indirect benefit to University				✓	✓	✓	✓
Direct benefit to school(s)			✓				
Indirect benefit to school(s)				✓	✓	✓	✓
Direct benefit to teacher(s)		✓	✓	✓	✓	✓	✓
Indirect benefit to teacher(s)							
Benefit to wider educational community (eg through dissemination)	✓	✓	✓			✓	✓

Personal and professional biography were key factors in the choice of project by the project leaders. These influenced the ways in which each project was conducted. In effect the projects followed the personal and professional interests of the project leaders, and these were related to their own histories:

i) BALIL Project followed the long term interest in children's views of moral issues of the project leader, a senior researcher.

ii) L.A.R.P.R.O. Project invited teachers to participate in clinical supervision groups. This followed an interest of the university researcher on teachers professional knowledge.

iii) Local History Project was led by a researcher who was Director of the Local History Centre. He was committed to the ideology of pupil inquiry based learning, and like-minded teachers were invited to join in this work.

iv) RUDIS Project followed the interest of a schoolteacher who had worked as a teacher educator, and was committed to (i) extending the use of computers in schools and (ii) forming closer teaching-learning links between teachers, student teachers and teacher educators.

v) School Development Project was led by a teacher educator, recently a school teacher, in schools in which he had taught. The emphasis in this project was 'practical' and teacher interest based.

vi) Principals' Project was led by a former school Principal who was deeply committed to provide support for school leaders.

vii) School Network Project was led by a practitioner who was a headteacher consultant and a university teacher educator, both of whom were committed to whole school development planning.

Figure 3 illustrates how the different kinds of university-school relationship reflected the interests, experience and purposes of the project leaders. It expresses these in terms of the dominant agendas and these relate to benefits received by the participants:

Figure 3 Dominant Agendas

Dominant Agenda	BALIL	LARPRO	SNP	SDP	PP	LHP	RUDIS
University	✓		✓				
School and Teacher					✓	✓	✓
University/Teacher						✓	✓

2. Intervention strategies

Partly as a result of the perceived individual interests, strengths and ideologies of the sub-project leaders and partly as a result of the demands of individuals and schools, each sub-project adopted different kinds of intervention strategies, either explicitly or implicitly. These both reflected the project leaders' theories of teacher development and change, and their perceptions of their own professional identities.

i) Entry Strategies: Trading in Trust

The project leaders had used similar entry strategies in identifying participants for their projects. In RUDIS, SDP, SNP, P.P. and LHP those involved initially were known to the leaders. These projects used existing networks; and in LAPRO the schools were known.

> '... These schools often take student teachers and there is a great interest in teacher education...' (SDP)

The PP was conducted with Principals of the schools in the SDP project, and even in the BALIL project, teachers were invited to the seminars on the basis of personal contact. This strategy of trading on trust in existing personal relationships, and knowledge of motivated, even like minded teachers, provides a positive strategic starting point, reducing the risk of innovation failure. There is a risk, however, that the group will become and remain in the eyes of other teachers a club to which entry is difficult.

ii) Negotiating Agendas: Strong classification, weak framing

The diversity of the individual projects was a source of both strength and weakness. A sense of ownership and identity within each project was well established and maintained. However, because the projects were individually framed there was little opportunity for debate and discussion between project leaders. A common characteristic among all the projects was their focus upon agendas which were implicitly, or in one case explicitly, negotiated. Whilst the source of the ideas was exclusively the leaders, teachers themselves opted in and, once participating, shaped the development of the content. For example, in SDP:

> '... he asks you what you want, provides it...'

The 'service role' of universities implied in this and other remarks by participants provides an interesting issue in relation to defining the nature of 'partnerships'.

'You need someone from outside'.

'Yes, not only for the students, but also for the teachers. If it had been a person sitting in Linköping at the university, it wouldn't have worked.'

Identifying the strengths and limitations of university researchers and teacher educators in relation to school and teacher development needs will be a key strategic factor in initiating and responding to system needs in the future. It is important to recognise, however, that each sub-project was perceived as relevant to need by the participants themselves. If the concepts of both cooperation and co-aptation between different levels within the system – schools, universities, teacher training and in-service – are to be applied in practice, then each must be developed for diversity, and take account of the need for a range of research and development strengths within the university system according to purpose and desired outcomes for the education system as a whole. This indicates the importance in, for example, regional School Development Centres, of planning provision related to a restricted range of clearly identified and articulated generic development needs.

3. Implementation: Conditions for Teacher Learning and School Development

Paradoxically, although schools are intended to be learning communities, teachers' daily teaching work provides limited opportunities for their own learning. The intensification (Robertson, 1996) isolation (Lortie, 1975) and busyness (Sharp and Green, 1975) of the environment in which most teachers still work are well documented. Practice makes only practice (Britzman, 1991), and single loop learning (Argyris and Schon, 1976) predominates as a means of control rather than emancipation. Indeed, even where the culture of the school encourages critical reflection through forms of collaboration and critical discourse about teaching, development time during school hours is limited, and the stress of the work itself ensures that beyond this energy levels are low for most teachers. Periods of innovation (eg school decentralisation of school management or the imposition of new curricula) may at least temporarily further sap the will and professional self confidence of teachers for whom the safest learning strategy is to minimise risk, 'play safe', and control the pace of change. Added to this, is the effect of the different life and professional and personal development phase of each teacher and school principal and the local policy contexts in which schools are embedded. The success of university contributions to individual and organisational development demands

considerable understanding of personal and professional agendas, as well as skill and commitment.

i) Time

Whatever the policy, research or development agenda, the key actor in change or development of any kind is the teacher; and his/her learning will be affected not only by the worthwhileness of the research, or the power of legislation or advice, but also by history (life, career, environment), current organisational culture and school leadership, (Talbert and McLaughlin, 1995; Fullan 1993) and quality and appropriateness of the intervention strategy employed by the 'significant other' – in this case, the university. There is no doubt that the offer of additional resources in the form of time, money and expert, consultant assistance in the shape of university personnel and student teachers was a motivating factor for the involvement of teachers. All talked of this as an incentive in what were currently very busy, stressful teaching circumstances. The provision of time both inside and outside official school hours had enabled sustained dialogue. This dialogue had the effect of increasing:

ii) the quality of thinking and planning, and so was an immediate low cost benefit for the school and its employers

ii) the professional self confidence of the participants, and so was a long term benefit for the individual, the school and its teachers and students.

The link between professional confidence, school culture and teaching effectiveness is well documented (Talbert and McLaughlin 1996, Bell 1996, Helsby 1995). In today's increasingly complex educational context with its emphasis on busyness, intensification and innovation, it is important to recognise the limitations of rational input – throughput – output models of implementation oriented training courses which aim to contribute to the quality of teaching and learning; and to consider ways of paying more attention to the thinking and professional self confidence needs of teachers in recognition of their importance to the energy, enthusiasm and intellectual needs of teachers which are essential to commitment to quality. As one principal said:

> 'All teachers need time to reflect, research, dialogue, 'think about the future'.'

The problem for researchers in projects which support innovative practices is how to provide continuing support for the teachers who will inevitably require further 'critical friend' and 'resource' support. In the absence of expert

colleagues in school, it is important that means are identified within the initial project design which ensure that this happens, eg by forming networks of teachers, particularly where projects have limited funding and limited life.

ii) Reflection

> 'What sensible organisation would forbid its workers to ask their colleagues for help, would expect them to carry all relevant facts in their heads, would require them to work in 35 minute spells and then move to a different site, would work them in groups of thirty or over and prohibit any social interaction except at official break times...' (Handy, 1989, p.173)

The opportunity to reflect alone and with others (SDP, SNP, PP), to have time to conduct research for the benefit of pupils (LHP), to learn from 'experts' (BALIL) to examine themselves as teachers (LARPRO) and to increase their teaching repertoires (RUDIS) were all offered as reasons for participation. This paints a picture of teachers whose development needs are not able to be met only from in-school, on-site resources, who perceive the usefulness of a number of different kinds of external stimuli at different times in their careers, according to different needs.

> 'You haven't got the time at work... you're always on the run'.

> 'Our working time as teachers is increasing...'

A common thread that ran through all the projects was the opportunity which they were presenting for teachers, principals and student teachers to take time to reflect:

> 'There's no time nowadays to reflect upon daily work, the future, our visions for the school... I need time to reflect upon things that we are doing, what we want, and a dialogue. (School Principal)

An experienced teacher talked of the stimulus provided by a student teacher's work in RUDIS as being:

> '... a good thing when you've been teaching for a long time for your own education...'

The nature of the reflection varied. For example, in one LARPRO project group.

> 'We were taken out to sit and talk to each other about our role as teachers, our different backgrounds... We didn't decide anything.

> We weren't taught any methods... The main thing was talking... about situations at work... whatever your wanted... as if you were throwing a ball to each other... and look at the question from different angles...

It may be possible to identify explicitly a number of different settings for reflection on and about teachers and teaching. For example,

Interactive Reflection (LARPRO)

Contemplative Reflection (BALIL)

Action related Reflection (RUDIS)

Research oriented Reflection (LHP)

Social Reflection (PP, SNP)

Subject knowledge Reflection (SDP)

Further issues are the levels at which people with different personal histories and professional experiences reflect, and whether reflection itself will lead to change.

> 'For some, this is the first time they are in connection with learning by experience, by process, instead of by traditional education. So for some this could be the start of a process, whilst others may use it as an ongoing process that has started long before... And maybe they can learn from each other...'

Individuals also have different needs. For example, the LHP provided the funds for one teacher to take time out of school in order to engage in research in order to collect resources for pupils to use in inquiry-based local history projects.

iii) Timing the Support: Introducing the Challenge, finding the Thread

The project demonstrated that it takes time to change attitudes and practice. Teachers are at different levels of readiness to learn, and the broader culture of the school and national and local policy contexts impact positively or negatively on the ability of teachers to take responsibility for their development. The role of the external interventionist should not, on the experience of this project, be confined to that of a facilitator and course organiser. Listening to teachers' needs and organising in-service courses and events on this basis only is too limiting. To be effective in the longer term the interventionist needs to be

a part of the school community. She/he must be able to engage in critical dialogue over time in order to (i) promote and sustain a series of reflective conversations about individual and institutional need within the school; (ii) contribute to the provision of appropriate further professional development events and processes; (iii) follow up the effects of these on teachers' thinking and practice; (v) negotiate the boundaries between individually and institutionally identified need; and (v) engage in productive dialogue with 'external providers' in relation to these.

There has been much criticism over the years of 'one shot' short information giving, technique trading, awareness raising courses as being fragmented and inadequate as a means of extending the professional and practical knowledge base of teachers. Information from the teachers in this project initially seemed to confirm that the courses had provided ideas, 'to use immediately in classroom, or to store for future use'. They had answered, 'some basic needs', but without changing or challenging the teachers. The teachers wanted now, 'more of an intellectual challenge' and spoke of their desire to engage in sustained discussion of 'pedagogical issues', and being supported in carrying out research into their own classrooms.

This would seem to point to a need for schools, universities and others to engage collaboratively in longer term strategic planning in order to provide a balanced diet of professional development opportunities which would relate both to the personal professional and organisational context and history of individual teachers and to the need to plan for different levels of outcome which would provide appropriate intellectual and practical challenge and support appropriate to the needs of individual teachers and schools.

Rational planning needs to be informed by consideration of personal professional learning and leadership dispositions of university tutors which themselves inform the kinds of intervention strategies and benefits which accrue, directly or indirectly, to individual teachers, university tutors and schools.

4. Three Kinds of Partnerships

The MILJON project provides empirical evidence of and justification for a range of school-university partnerships related to different purposes and resulting in different outcomes.

i) Ideological: Searching for like minds

BALIL embodied particular educational ideologies. It was concerned with

disseminating particular views of teaching and learning, and so its success depended upon attracting like-minded participants whose values converged or coincided:

> 'When you want to change and not work yourself dead, you have to work together with people who are willing to work... maybe what we have found in BALIL could be a little bit along the road of getting better contact between university and school... I have found that those teachers and student teachers who attended our seminars are interested in getting research-based knowledge out into school, but didn't know how to do it.

It may be said that this project was not aimed at influencing change but a search for colleagues with shared values so that these could be reinforced and disseminated. The aim had been to strengthen teachers' professional identities through seminars which would give 'theory hungry teachers who are saturated with practice' and 'eager to get theoretical' new research based perspectives on their subject and their future work. Teachers were treated as 'intellectuals'.

> '(Many teachers) have a low status... so they are keen on getting the intellectual instruments to debate/discuss with colleagues... we tried to do something (in BALIL) with primary teaching students, because their status is lower... their professional identity is connected to knowledge of the subject... But now discussing research findings concerning children's thoughts about different aspects of life is giving some kind of scientific ground for discussing their specific type of professional knowledge... We could contribute to strengthening professional identity through these kinds of studies...'

The ideological orientation of this project, like the Local History project, was not aimed at influencing change, but a search for colleagues with shared values so that these could be reinforced and disseminated. A case can be made for the support of such a model, however, since it both asserts the research function of university academics and the traditional (but pre-National Curriculum) professional autonomy of teachers:

> 'politicians too often measure the impact of research on a very primitive level... they never ask if somebody has read something and started to think in a different direction... in the past we used to produce a lot of teaching materials and they never survived

more than three or five years. But the analyses we made in order to write these materials, they have survived...'

ii) Generating Research Knowledge about Education

LARPRO was the only one of the projects which explicitly aimed at generating knowledge of teachers' learning under controlled, experimental conditions. In this sense, its function was to co-opt teachers into the experiment, extract information, and leave the scene in order to analyse, interpret and publish. This kind of partnership is characterised by the university maintaining its research knowledge expertise through work in which participants themselves are 'subjects'. It can, however, raise ethical issues.

There had been no initial negotiation regarding the facilitator's role, and no discussion or feedback of results following the end of the project. This raises ethical issues of control (of interpretation), ownership (of data), and utilisation (of interpreted data) within and outside the primary university-school research oriented partnership. Members of the group commented about this and about accessibility of university produced research findings more generally.

'I don't like this (lack of negotiation), because they do this over and over again, everywhere, and I hate it. It makes me upset every time, especially where children are involved...'

'When they write and publish their findings... you can't read, as a normal person... I am very interested, but when I start reading, I stop. It's impossible...'

'It's written for a selective group. And that's too bad, because really every research work done within the field of teaching would be very interesting for us to listen to, read, and maybe get some good ideas from...'

'It would be interesting to get the papers so we can read them, then discuss it with them afterwards...'

Whilst the kinds of partnerships represented by the work on this project are perfectly legitimate, they perpetuate a perceived and practised separateness between teachers (whose principal role is to teach children), teacher educators (whose principal role is to teach teachers), university and school administrators, whose role is to manage systems, academics (whose principal role is either to pursue their subject disciplines or pedagogical concerns), researchers (whose principal role is to follow their 'curiosity' interests), and municipal politicians

(who have had little formal role in either pre or in-service teacher education). Traditional forms of contact between universities and schools (through lectures, short courses and university dominated research agendas) emphasise separation rather than integration of purpose. The different worlds of universities and schools are further emphasised by the poor dissemination and perceived irrelevance to practice of research information by scientific publication which is often couched in the inaccessible language of the academy, and does not easily match the time constraints of teachers whose reading is limited largely to 'popular' literature. Further evidence is through continuing university domination of the knowledge agenda such that 'academic' knowledge and qualifications remain of higher status than 'professional' knowledge. Professional discourse of teaching and learning is still dominated by academics. Teachers themselves have still to find a voice that 'counts'. (Cuban 1992; Day 1991; Zeichner 1995).

In investigating teachers' work in order to produce knowledge about teachers, researchers must also take into account the effects of individual and organisational cultures. It is necessary to understand and take into account for the purposes of interpretation the facilitative or constraining histories of both individual and school cultures in order to contextualise the work so that the motivations, processes and results might be better understood and better utilised by both research and user communities.

iii) Capacity Building: Sustained collaborative interaction through networking

The Principals' Project, the School Network Project, Schools Development Project and RUDIS had relied for their success upon establishing and extending the capacity building capabilities of teachers through long term investment of time in negotiating, supporting and interacting with the participants' agendas. The project leaders had established a 'service' role in which they had contributed their expertise within contexts in which the participants were recognised to have complementary expertise. Dissemination for these projects was, therefore, not an issue since it was built into the iterative partnership processes. In effect, the leaders of these projects were change agents 'at the heart of the system'. Within this model, however, each had a different emphasis.

- In the Principals' Project, the main purpose was to provide moral and intellectual support. The effect of the process of challenging but supportive dialogue over time led by a credible, authoritative and empathetic interventionist was a rise in professional and personal self confidence:

'I've got more strength... I'm not so scared to give my opinion (to those in authority)... in some ways (prior to this) I wasn't worth anything to myself... I was small in the school system... Now I have found that I am still a person who can think and do things well...'

Ways of thinking had changed also:

'We learned from one another. (The project leader) had people with her who gave us time... everybody we met gave us things... so we could give one another things to work with... If we hadn't met (the project leader) the design of the new schools would have been different... I can't point to any special change... there were many small things...'

- In the School Development Project, the project leader had recognised individual teachers' responsibility to articulate need. Because there had been no support infrastructure in their schools, they had not been able to iterate or integrate these with whole school development planning. Their Principals were critical of the projects:

'... He did things only the way the teachers wanted (So what? What was the result? Where should it lead?) There was no connection between what we did and what he did with the teachers. I didn't know what was going on in my own school! I don't think of school development without the principal. The teachers liked it, but I don't know what is coming out of it...'

However, the teachers themselves were positive about the experiences, and were able to discern the 'red thread' of connection between individual and school development:

'It's good for the school too... It must start with the teachers...'

They saw the benefits of attending courses outside the school on their individual and collective work inside it:

'It's easier to get together, to work together and discuss in groups inside the school. We got to know each other well...'

The teachers in RUDIS also appreciated being listened to and provided for. The sense of self esteem and confidence which these projects gave should not be underestimated. Prior to it they had been, 'starved of opportunities' for development. As in SNP, having someone who was credible and trustworthy (one foot in school and one in university) enabled trust to be built quickly – 'even for (the project leader) it took a lot of time to explain, make us interested... if it had been someone from the outside, I would have been very suspicious...'

- In the School Network project the project leaders had based their work with schools upon seven key stages:

(a) School leadership/culture: In all the schools, the principals were actively involved in interacting with their staff in promoting collaborative cultures:

'It's not the principals who have driven the project. It is some of the teachers. When the principals thought that they had too much to do and not enough time, then the teachers pushed them... 'If it is important we want you to support us' ... A small group of teachers in every school was the motor of the project...'

(b) Agreeing the goals

'Another thing that's important is to be aware of the difference between the goals and the way you choose to reach the goals... Often when we argue about what to do we are arguing about the way of doing it – 'Is it your way or mine that is better?' But if we can agree on the goals.... it's a more professional way of acting... so we worked a lot with goals, building a shared vision... We had the same goals, but the way they achieved them was their decision... It's deeper, more complicated, harder... But... from their reactions they felt more secure in what they were doing.'

(c) Investing in the process: personal and professional commitment

'The challenge was to get all the schools involved... even if we didn't have exactly the same values... we worked hard on this because not all the schools were committed initially... It's very important that you work hard on the first phase of the development process, when you mobilise. You can't start directly. You have to discuss purposes, goals, what is the contract – what's in it for me, for you. What we expect from each other... and give it time. Let them think, go back (to school) and talk and give the first period time. It's most important. And then it's a critical phase when you start a project, that you really follow up what is happening... work with both the principals and the teachers... try to be aware where in the process you are, what is happening and that you feel personally that what you are doing is important... be honest...'

(d) Being realistic and reflective

'... it's important to be realistic about what is possible and what time you have ... to see that it might take two or three years. Because if you don't reflect on what you've done... you don't get a chance to improve... we have

to continue to support a project that we have started even after it has been implemented, not leave it there and start another. We have to follow it over time, and be aware of (our role in) both the subject matter of the project and the process... It's both... To work with school development, you have to work with the process all the time.'

(e) Make it important

'From the schools' point of view, they feel they're involved in a very important project. They are very aware of it'.

(f) Provide knowledge and skills appropriate to need: making the right contract

The project leaders were able to provide knowledge and skills which were relevant to the project's theme of evaluation. For example, they provided lectures on different kinds of evaluation and way of implementing the new curriculum as well as team working and reflection.

(g) Celebrating achievement

Identify 'staging posts' in the project when its objects have been achieved and ensure that these are recognised and shared.

Together these characteristics confirm and go beyond Michael Huberman's identification of principles for successful networks, ie demonstrating sustained interactivity, commitment to longevity, interlinked projects, strong leadership, supportive infrastructures and intellectual coherence (Huberman, 1995). They demonstrate the importance of researchers who can contribute to quality development by:

- working with schools to identify their development agendas;
- providing intensive 'critical friendship' support throughout;
- ensuring collective vision building and goal clarification in the early 'mobilisation' phase;
- providing opportunities for review of progress and direction at key stages in the development process;
- ensuring a sense of completion and achievement through summary meetings and dissemination.

Conclusions:

The Challenge of Intelligent Service

In providing opportunities for reflection, the MILJON project implicity addressed the core universal moral purposes of teaching. It recognised that teaching is a 'profoundly moral activity' (Fenstermacher, 1990, p.133). Essentially, through the provision of networks, critical friendships, peer coaching, on and off site reflection, analysis and planning each individual project assisted teachers who had been 'increasingly thrown back on their own reflective resources as a basis for moral judgement'. (Hargreaves, 1995) As Hargreaves writes:

> 'Teacher development can help teachers articulate and rehearse resolving these moral dilemmas in their work. By reflecting on their own practice, observing and analysing other teachers' practice or studying case examples of practice, teachers can clarify the dilemmas they face and develop principled, practical and increasingly skillful and thoughtful ways of dealing with them... This approach to teacher development elevates the principles of thoughtful, practical judgement above personal prejudice, misleading moral absolutes, or the false certainties of sciences as a guide to action and improvement...'
>
> (Hargreaves, 1995)

The project provides empirical data that teaching is more than a technical craft and that teachers and schools have both cognitive and affective needs. The success of the projects within it seemed to be based upon 'sustained interactivity' (within and between teacher educators and teachers), a characteristic of successful innovation (Huberman, 1993). They were 'teacher' rather than 'practice' oriented, recognising the complexities of teacher need and teacher development at different times, in different environments and for different purposes, asserting implicitly that the job of being a teacher and the act of teaching demands thought, commitment, knowledge and passion.

An abiding dilemma for universities around the world who wish to connect with the emerging new professionalism of teachers and schools is how to give importance to the legitimate interests and concerns of both the academy and the schools. In the evidence from the evaluation of the work of the MILJON project project it is clear that whilst headteachers and teachers value university contacts, and wish for more, there is some suspicion of motive and relevance;

and this resonates with the experiences in many other countries. Bound up as schools are in coming to terms with new curricula, management and teaching practices and maintaining and visibly improving standards of teaching, learning and achievements, it is not perhaps surprising that the MILJON project itself was regarded by headteachers as only one of several innovations. 'We wonder why the university is doing it. Is it interesting for them? Or are they just coming here because they have needs...'

These perceptions raise important issues in relation to value congruence (between teachers in schools and those from the university), care, emphasis, qualification and experience which need to be addressed by the academy. As it moves towards different forms of partnerships with teachers and schools it needs to engage in internal as well as external dialogue in relation to the quality control of its programs.

> '... It has been two worlds, and research and discussion has been a world of its own in the university...'

The challenge for universities is to engage in strategic planning for initiation and response through which their capacity to respond to schools' agendas as well as to take forward those of the academy will be increased. In developing new kinds of relationships with schools and teachers they will be demonstrating a service-wide commitment in which traditional expertise (eg in research and knowledge generation) is combined with new expertise in knowledge creation, development and consultancy as part of a more diverse portfolio which connects more closely with the needs of the school community at large. Such a portfolio would demonstrate the moral purposes of university educators to improving teaching and learning in collaboration with schools and teachers; and a commitment both to producing knowledge about education and generating knowledge for education (Carr and Kemmis, 1986) which could be utilised and tested by the system for which it has been produced, either directly or indirectly. Current perceived problems of relevance of research and fitness for purpose of programs of study and curriculum materials would be minimised.

Successful teacher and school development in the 1990s and beyond in Sweden and elsewhere will depend upon: (i) increased team planning and teaching (in order to implement the national curriculum), (ii) increased knowledge and skill responsibilities of teachers (in order to meet a greater variety of demands); (iii) teacher development which focuses more on synthesising school identified needs with those of individual teachers; and (iv) increased principals' responsibility for school development planning which

ensures that all staff,'are travelling in the same direction'. It is likely, then, that systematic strategic planning through discussion and dialogue within and between schools will increase as the pressure for publicly demonstrated achievement of pupils and, by association, competence of teaches follows the implementation of curriculum and management reform. Yet, paradoxically, isolation and fragmentation are likely to increase as time for personal reflection, considered critical analysis and collaboration will remain a difficulty for schools. The reform of teacher education has ensured that, far from being a tool for state steering, its influence, like teacher education in many other countries (eg. England and America) may be becoming more marginalised. Unless it can seize the moment, in each region, to explore partnership opportunities which bring together pre and in-service teacher education, research and development, university teachers and teachers, school principals and representatives of the local community, then it is likely that the existing gulf between higher education and schools will grow even greater.

The MILJON Project has provided data concerning the efficacy and effectiveness of different partnership models which may be applied in other social and geographical settings. Its sub-projects model the range of such relationships between teachers, schools and university researcher-educators. They are a recognition of the importance of establishing partnerships as a condition for building 'communities of practices' (Lave and Wenger, 1993) and provide a useful source of information for national and local policy makers about teacher and school development and the roles which universities may productively play in this. Yet the difficulties in achieving these long term partnerships cannot be overemphasised for learning is located, 'not in the acquisition of structure, but in the increased access of learners to participating roles in expert performance' (Lave and Wenger, 1991, p.17). Organisational solutions of different kinds may be applied, eg the establishment of research centres in which 'academic' researchers adopt 'service' roles in, 'helping teachers interpret, understand and reflect on their own practice' (Askling and Almén, 1995). The real issue to be addressed is in finding effective intervention principles and strategies which change the cultures of pre-service and in-service teacher education so that they can contribute to the development of a national conceptual framework for university-school partnerships which will contribute to raising further the quality of education in both.

In Sweden, as in many other countries, educational reforms in schools have resulted in more collective (if not always collegial) planning and evaluation by teachers of their work in order to ensure the progression and continuity

necessary to achieve externally prescribed targets. The traditional isolationism identified in America in the 1970s (Lortie, 1975) has been at the least eroded, as teachers increasingly engage in agreement-seeking discussions on a range of issues of governance and curriculum with school managers, parents and students themselves. There is an unresolved issue, however, in relation to the response of university tutors to the reform contexts in which both schools and universities are involved. More than teachers in schools, tutors in universities have long established and strongly defended 'expert' individual and collective identities (Becher, 1989). Changes in the traditional licence of tutors in universities to follow their individual research and knowledge interests by which they identify their substantive 'professional selves' are less easy to legislate (though attempts are being made in America through Professional Development Schools and in England through school-centred initial teacher training; and through the development of funding related research assessment exercises in England). Historically, many tutors were appointed precisely because of their uniqueness in terms of research and certainly not because of their human relating or management qualities, skills or community service ethic. Yet this once institutionally valued 'selfishness' is now less valued by the wider educational community and tutors are being required to change to a more institutionally defined needs-based agenda which demands collaboration, the learning of new knowledge, and acquisition of new skills in which personal choice must be complementary to collectively identified targets. For many academics 'requirement' means resistance if only for the purposes of self preservation. More importantly there is a role for management, engaged as they are in strategic thinking, defined as

> 'seeing: seeing ahead, seeing behind, seeing below, seeing beside, seeing beyond, and above all, seeing it through'.

to ensure that moral purposes are revisited and that different connections are made which mirror the changed imperatives of teachers and schools within a balance of intelligent service to a number of different communities.

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THE QUALITY OF TEACHING IN HIGHER EDUCATION: THE CROATIAN CASE

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Background

Because of growing demands on higher education institutions to be accountable and to adapt to the rapid change of technologies, higher education democratization, reduced funds, etc., the question of quality of university teaching has been stressed in recent decades. Several conceptualizations played their role in attempts to improve quality in higher education: quality as exceptional (Moodie 1986), quality as perfection or consistency (Ingle 1985), quality as fitness for purpose (Ball 1985), quality as value for money (Schrock & Lefevre 1988), quality as transformation (Harvey and Knight 1996). Although many factors influence the quality of higher education (tradition, equipment, resources, students), the key role of higher education teachers in the improvement of higher education teaching is widely recognized. Harvey and Knight (1996) argue that "key to quality improvement lies in empowering academic staff to undertake a process of continuous quality improvement in relation to student learning".

It is widely recognized that university teaching could not be defined only as "transfer of knowledge". As the result of growing information and new technologies, knowledge is considered as open, dynamic system, the result of active construction of each individual and interactions between existing concepts and new experiences, which can be used in different contexts (Vermunt, J.,1989). University teacher needs to be helped through education which leads him to analyze and reflect on teaching, and not to be given "final" solutions, educational and psychological theories or didactic principles (Schon, D., 1987). Teaching for learning is something that might be learned, not an accident of personality. Therefore educational development is of great importance.

Although the search for quality in higher education teaching is now regular activity for every university which attempts to achieve a significant position in future, and for many of them it is also an obligation to which they have to respond, it was the paradigmatic turnover in theories of learning that influenced the professionalization of university teaching and university staff development. Serious discussions on these topics began in Europe in 60's, when many university staff development centers were being set up. In general, these programs have two goals: to qualify university staff for teaching and to improve university teaching (Berendt, 1985). Much work in this field has been done in many European countries, especially Germany, Great Britain and Netherlands. In the United States, in spite of emphasized research activity of (elite) universities, university staff development centers are widely developed. Universities in Australia and New Zealand are well-known for their search for quality in teaching, and it could be stated that this "movement" has become global.

However, even today there are areas where improving quality of teaching is still not considered an important activity. In Croatia (now independent republic which was part of former Yugoslavia), and its' four universities, the initiatives for improving teaching in higher education exist only as sporadic and periodical activity. The reasons for such a situation are several. One of the most important factors for neglecting the quality of teaching is well know dispute about the relationship between research and teaching activities at the universities. The stereotype opinion that a man of science, an expert in the field, is automatically also a good teacher is rather strong. What demotivates the initiatives for improving teaching and learning is also the "legal" aspect of the problem: although proclaiming that research and teaching have equal importance at the universities, in the process of election and re-election of university teachers it is research that prevails (Lediç, 1992). According to the Law on Higher Education, for the most of the university teachers there is only one occasion in their academic carrier that they have to present publicly their teaching abilities: at their habilitation lecture. Students' evaluations are exceptional. In the whole country, no unit or university centre for the improvement of teaching activities exists. Universities themselves are extremely inert, almost avoiding to meet the change and transform according to the needs of modern society, and are rather answering only to legislative demands for their accountability.

As mentioned before, there are four universities in Croatia: the biggest and the oldest *University of Zagreb*, (founded 1874, 45010 students in 1995), the

Josip Juraj Strossmayer University in Osijek (founded 1975, 6 343 students), the *University of Split* (founded 1974, 9763 students), and *University of Rijeka* (founded 1973, 7 657 students).

Although the Law on higher education declares different sources for financing higher education (foundations and donations, tuition fees and scholarships, other sources if they are in accordance with the function of the institution of higher education), the vast majority of higher education is financed from the budget of the Republic of Croatia. According to the law, university teachers are classified into the two groups: *auxiliary teaching staff* (expert associate, junior assistant, assistant and senior assistant) and *teaching staff* (assistant professor, associate professor, full professor).

One of the bodies which are entitled to guide the directions for the development of higher education in Croatia is *The Rectors' Conference*. The members of this body are rectors of all the universities, and - among other activities - the Conference establishes conditions for the assessment of teaching and professional activities in the process of university teachers election. This means that the criteria and the election procedure is not left to discretion of a particular university.

The National Council for Higher Education (president and 18 members appointed by the Parliament), is founded in order to take care of the development of the higher education system. It "shall give its opinions, proposals and recommendations to institutions of higher education, to the Ministry and to other state bodies with the aim of ensuring the qualitative and successful functioning of the higher education system". (Art.132, HE Law). The Ministry shall obtain from the National Council an opinion and initiative for introducing new or abolishing existing programs, courses of study and institutions of higher education. Having in mind this very important role of the National Council for Higher Education, and Ministry of Science as main (almost exclusive) source for financing higher education, it may be considered that the autonomy of Croatian universities is rather restrained.

In addition, the universities usually do not take proactive position in the evaluation procedure. According to the Higher Education Law (Art.134), the testing of the necessary level of quality and efficiency of teaching, scientific and professional activities shall be evaluated every five years. The evaluation shall be initiated by the Ministry. The evaluation process shall be carried out by expert commissions of the Ministry, and their members shall be appointed by the minister at the recommendation of the National Council. The National

Council shall participate in the procedure of evaluation and is going to determine the quality needed for an institutional accreditation to be obtained. Expert commissions shall base their assessment on the self-analysis of the institution of higher education, the opinion of professional societies and reputable international experts. The Ministry shall submit the report and assessment of expert commissions to the National Council which has to express its opinion. It is obvious that - except self-analysis, the universities play passive role in the process of assessment, which has strong "top-down" direction with the summative evaluation stressed.

Although universities stay idle in most of the cases, without much interest to improve the quality of teaching, the attempts for improving teaching and learning at the universities in Croatia may be found. Beginning in 1990, the Ministry of Science funded the research project "The Presumptions and Criteria of Effectiveness of University Teaching". The results (Lediç, 1990, 1992b, 1995) have shown that university professors in Croatia did not express the need for their development, while at the same time many of them do not have essential knowledge on higher education teaching methods. Teaching at Croatian universities is in the most cases traditional, because teachers mostly follow their educational experience and are not given information about more efficient teaching methods. In addition, university professors expressed doubt in staff development as factor for improving teaching and learning. Motivation for staff development is weak. On the other side, students expressed dissatisfaction with the quality of teaching.

It may be considered that university teaching in Croatia is issue with very serious problems. It is obvious that the indicators of the quality of teaching have been negative: dissatisfied students, traditional teaching, lack of the need for the improvement, doubt in education as a mean for better teaching. This led us to the conclusion that a model for improving teaching and learning at the universities in Croatia should be proposed and applied.

In the study previously mentioned, some recent approaches to the improvement of teaching and learning at the universities were examined (TQM, reflective practitioner approach), as well as different models of staff development (Lediç, 1993, 1993, 1994). The conclusion was, that in order to improve teaching and change the institutional culture towards a more responsible attitude towards teaching, it is necessary to develop and apply an adequate university staff development model according to the international standards, but adapted to our tradition and circumstances.

In 1995, we proposed a project proposal for the research "The Quality of Teaching in Higher Education". The aim of this research is to explore internationally accepted criteria of quality concerning higher education (especially those closely connected to teaching competencies of higher education teachers), to find out the scope in which these criteria are respected in Croatian higher education, and, finally, according to these results, to develop a model of university staff development, which aims to build up the "culture of quality". According to our previous results and experience form the actual practice, we presumed that:

(1) the quality criteria, as well as higher education teaching practice in Croatia, differ significantly from the criteria accepted in international literature and practice;

(2) the quality of teaching (seen primarily through student's evaluations), is not satisfactory enough.

According to the results, in the second phase of our research we plan to develop a model for improving teaching and learning at the Croatian universities according to several basic assumptions: knowledge as opened, dynamic system; university staff development based on the "reflective practitioner" principle; continuous quality improvement based on "new collegialism" approach. This approach is chosen to stand as counterbalance for the almost purely external approach given in the Law on higher education. This approach considers university group as a forum for academic decision making and it enlarges the group to open discussion to others interested in the quality of teaching, primarily students.

Method

In order to explore the quality of teaching in higher education, we developed questionnaires for exploring the opinions on quality of teaching for university teachers and for students. According the experiences from the similar studies (Cox, 1994; McKeachie, 1987; Penner & Centra, 1993; Booth & Hyland, 1996; Cvetek, 1993; Marentič-Požarnik, 1995; Andrews, 1996; Chickering, 1987), and our own experience, we prepared the list of 15 criteria, which were the core of the questionnaires. We used the list of the criteria in two main queries:

1. to explore the teachers' and students' opinion about the general importance of the criteria (assessment of the relevance and contribution of each criterion to successful university teaching), and;

2. to explore the teachers' and students' opinion on the extent in which every criterion is respected in actual teaching at the university (teachers were assessing their own teaching practice, and students were assessing their overall experience at the university).

The criteria we presented were:

1. Teaching objectives are clearly defined.
2. Students' interests are encouraged.
3. Teachers are well prepared for their teaching.
4. Teachers are experts in their subject.
5. Teachers are enthusiastic for their subject.
6. Teachers emphasise important parts of the subject.
7. Teaching methods are used which encourage active cooperation by students.
8. Active and independent student learning is encouraged.
9. Teachers respect students' individual differences.
10. Teachers ask for feedback.
11. Teachers respond to students' feedback.
12. The assessment of students is fair and reliable.
13. Individual courses are designed so as to contribute integrally to a student's subject of study.
14. Books and other resources are available.
15. Teachers show readiness to help.

The teachers and the students were supposed to express their opinions on the 1-5 scale , checking 1 if their opinion was that a certain activity does not influence on the achieving quality of teaching at all, or 5 if it influences a lot, and - when actual teaching is assessed - checking one when certain criterion is not respected at all, or five, when it is respected always. Our intention was to examine:

a) the difference between "ideal" (assessment of the relevance and contribution of each criterion to successful university teaching) and "real" (assessment of the extent in which every criterion is respected in actual teaching at the university) according to the teachers;
b) the difference between "ideal" and "real" according to the students;
c) the difference between "ideal" when teachers' and students' opinions are compared;
d) the difference between "real" when teachers' and students' opinions are compared.

The sample of the teachers and students was chosen at the University of Rijeka. This University incorporates: The Faculty of Economics (ECO Rijeka), The Faculty of Economics and Tourism in Pula (ECO Pula), The Faculty of Civil Engineering (CIVIL ENG), The Faculty of Hotel Management (HOT), The Faculty of Medicine (MED), The Faculty of Education in Rijeka (EDU Rijeka), The Faculty of Education in Pula (EDU Pula), The Maritime Faculty (MARI), The Faculty of Law (LAW), and The Faculty of Engineering (ENG).

For the teachers, a personalized cover letter accompanied every questionnaire. A self-addressed envelope was provided. The questionnaires were anonymous, but the opportunity was given to fill in the name and address for future communication and collaboration. Since the questionnaires were anonymous, we did not have the opportunity to send the questionnaires a second time.

The questionnaires were sent to every teacher from every school at the university; the sample was chosen only at the Faculty of Medicine, because the number of the faculty greatly outnumber other schools, and - since a part of our analysis will be done according to the different disciplines, we excluded a number of faculty in the field of medicine to minimise bias caused by this discipline.

For the students we used a different approach. Our intention was to question students who attended their third year of study at the university. The third year was chosen because we presumed that these students have enough experience with university teaching. At the same time they are far enough from finishing their course work so they may be motivated and involved in the process of the university teaching improvement. With the agreement and help of the deans of every school at the university, our team had precise appointments in which the questioning had to be done. Usually, they were left about 10 minutes to fill-in the questionnaire. It might happen that some of them needed more time, and were not in the position to think seriously about the questions.

Results

a) Participants and their willingness to cooperate

Table 1 shows the participation of teachers and students in the research, number of questionnaires received back, and participants' interest in cooperation. The percentage of the questionnaires received back from the teachers was 35,19%, which might be considered as sufficient for the analysis. Since the questionnaires were anonymous, we did not send them another time. The interest in obtaining results of the research and the future cooperation is rather high (50,93).

SCHOOLS	ED Rijeka	ED Pula	MED	ENG	CIVIL ENG	ECO Rijeka	LAW	MARI	HOT	ECO Pula	TOT
TOTAL SENT TEACHERS	120	44	86	72	35	44	28	46	55	33	563
TOTAL BACK TEACHERS	56	14	28	22	11	10	12	12	23	15	203
% BACK TEACHERS	46,67	31,81	32,56	30,56	31,43	22,73	42,86	26,08	41,82	45,45	35,19
INTEREST TEACHERS	30	5	18	8	2	5	6	7	16	11	108
% INTEREST TEACHERS	53,57	35,71	64,29	36,36	18,18	50	50	58,33	69,57	73,33	50,93
TOTAL QUEST. STU.	146	34	29	19	26	72	24	26	58	35	469
INTEREST STUDENTS	19	5	2	1	7	14	1	1	9	4	63
% INTEREST STUDENTS	13,01	14,70	6,90	5,26	26,92	19,44	4,17	3,85	15,52	11,43	13,43

TABLE 1. SAMPLE: TEACHERS AND STUDENTS

The table also shows the number of interviewed students and their interest for cooperation. It might be seen that the students' interest is rather low, only 13,43%.

b) The analysis of the criteria

The 15 criteria were presented to the teachers and to the students from two aspects: "ideal" (assessment of the relevance and contribution of each criterion to successful university teaching) and "real" (assessment about the extent in which every criterion is respected in actual teaching at the university). The first step in our analysis was to count the percentage for the each criteria according to the teachers and students and their assessment of "ideal" and real". The further step in the statistical analysis was ranking each criterion. These results are presented in Table 2.

CRITERIA	IDEAL				REAL			
	MEAN		RANK		MEAN		RANK	
	TEA	STU	TEA	STU	TEA	STU	TEA	STU
1. Teaching objectives are clearly defined.	4,61	4,37	3	7,5	4,32	3,27	7	3,5
2. Students' interests are encouraged.	4,31	4,42	10	5	3,88	2,53	11	12
3. Teachers are well prepared for their teaching.	4,81	4,50	1	3	4,46	3,48	3	2
4. Teachers are experts in their subject.	4,78	4,65	2	1	4,45	3,93	4	1
5. Teachers are enthusiastic for their subject.	4,24	4,09	11	11	4,21	3,12	8,5	5,5
6. Teachers emphasise important parts of the subject.	4,41	4,39	7	6	4,44	3,27	5	3,5
7. Teaching methods are used which encourage active cooperation by students	4,18	4,07	12	12	3,82	2,43	12	13
8. Active and independent student learning is encouraged.	4,57	4,24	5	10	4,21	2,70	8,5	8
9. Teachers respect students' individual differences.	3,59	3,88	15	13	3,38	2,16	15	15
10. Teachers ask for feedback.	4,01	3,71	13	15	3,78	2,67	13	9,5
11. Teachers respond to students' feedback.	3,82	3,79	14	14	3,62	2,32	14	14
12. The assessment of students is fair and reliable.	4,60	4,61	4	2	4,53	2,67	2	9,5
13. Individual courses are designed so as to contribute integrally to a student's subject of study.	4,39	4,25	8	9	4,36	3,12	6	5,5
14. Books and other resources are available.	4,37	4,49	9	4	3,91	2,59	10	11
15. Teachers show readiness to help.	4,42	4,37	6	7,5	4,56	3,06	1	7

TABLE 2: TEACHERS' AND STUDENTS' DIFFERENCES BETWEEN "IDEAL" AND "REAL" (MEANS AND RANKS)

Discussion

a) Participants and their willingness to cooperate

In the background of this research it was presented that there are very few "bottom up" initiatives to improve the quality of teaching and learning at the universities in Croatia. Since this process is - according to the Law on Higher Education - presumed to be established mostly from the "top down" direction, our intention was to examine university teachers' own motivation for the improvement of teaching. According to our results, it seems that there is a "critical mass" of academicians who are interested in this problem. They indicated their motivation by signing the questionnaire which included data that some of the participants would rather keep anonymous. However, what seems to be rather pessimistic is the absence of students' willingness to cooperate. Partly, this could be explained by the circumstances in which they were supposed to answer the questions.

b) The analysis of the criteria

From the ranks of the "ideal" teaching we may shape an image of quality teaching: teachers who are well prepared for their teaching (1) and are experts in their subjects (2), who teach with clearly defined objectives (3) and assess their students fair (4). We may call this a rather "traditional" view on quality teaching, especially when having in mind that respect for students' individual differences (15), respond to students feedback (14) and asking for feedback (13) are ranked the lowest. We may even conclude that teachers' primary interests are they themselves and their subject-matter, while students are not in the center of their interest. However, the students' image of quality teaching is almost the same: students value teachers - experts in their subject (1), fair assessment (2), well prepared teachers (3) and available resources (4). What they consider least important are the same criteria we found for teachers: asking for feedback (15), responding to students feedback (14) and respect for students' individual differences (13).

Although our research has shown that the image of quality teaching according to the teachers and according to the students is almost the same, their opinions change when the extent in which every criterion is respected in actual teaching at the university is assessed. Here teachers show that the main features of their actual teaching are their readiness to help (1), fair and reliable assessment (2), and well prepared teaching (3). The least they actually manage to do is similar to their opinion on the unimportance of criteria: to respect student's individual differences (15), respond to student's feedback (14) and to ask for feedback (13). Students think that teachers really are experts in their subjects (1), are well prepared for their teaching (2), emphasise important parts of the subject (3,5) with the clearly defined objectives (3,5). The students and the teachers are in agreement when the least respected criteria are considered. However, it should be noted that students do not agree with the teachers in their high assessment of their readiness to help (ranked 1 from teachers and 7 from students) and fair assessment (ranked 2 from teachers and 9,5 from students). This may serve as an indication that teachers' and students' perception about the quality of "real" teaching differ.

It is significant that the criteria where the biggest difference is exposed are those related to the students (more than to the teachers or to the subject matter). This leads us to the conclusion that students are, in a way, the most neglected part in the teaching process. This has been proved by the statistical test: Wilcoxon Matched Pairs test (Table 3) has shown us differences between

teachers' and students' assessment: according to the students, there is significant statistical difference in the assessment of each criterion, when compared as "ideal" or "real". Among teachers, the differences are smaller, and for some criteria significant statistical difference between ideal and real could not be found. However, when we compare the correlations between teachers and students assessment of "ideal" and "real teaching", then the differences are surprisingly big. Mann-Whitney's U test (Table 4) has shown substantial differences between several criteria; the most significant are the differences in fair assessment and readiness to help: while for teachers there is no significant difference between the importance of these criteria and the extent they are respected in the actual practice, students here estimated the biggest difference between "ideal" and "real".

	TEACHERS			STUDENTS		
CRITERIA	RANK (IDEAL)	RANK (REAL)	Z	RANK (IDEAL)	RANK (REAL)	Z
1. Teaching objectives are clearly defined.	3	7	5,09	7,5	3,5	14,83
2. Students' interests are encouraged.	10	11	5,85	5	12	17,33
3. Teachers are well prepared for their teaching.	1	3	6,05	3	2	14,33
4. Teachers are experts in their subject.	2	4	5,63	1	1	12,26
5. Teachers are enthusiastic for their subject.	11	8,5	0,64	11	5,5	12,75
6. Teachers emphasise important parts of the subject.	7	5	0,35	6	3,5	14,58
7. Teaching methods are used which encourage active cooperation by students.	12	12	4,94	12	13	16,35
8. Active and independent student learning is encouraged.	5	8,5	5,33	10	8	16,13
9. Teachers respect students' individual differences.	15	15	3,26	13	15	16,14
10. Teachers ask for feedback.	13	13	3,16	15	9,5	13,12
11. Teachers respond to students' feedback.	14	14	2,28	14	14	15,65
12. The assessment of students is fair and reliable.	4	2	1,18	2	9,5	16,69
13. Individual courses are designed so as to contribute integrally to a student's subject of study.	8	6	0,83	9	5,5	14,01
14. Books and other resources are available.	9	10	6,04	4	11	16,75
15. Teachers show readiness to help.	6	1	2,54	7,5	7	15,11

TABLE 3: WILCOXON MATCH PAIRES TEST (TEACHERS AND STUDENTS, IDEAL VS. REAL, SIGNIFICANCE LEVEL Z=1,96; p<0,05)

CRITERIA	IDEAL			REAL		
	RANK (TEA)	RANK (STU)	Z	RANK (TEA)	RANK (STU)	Z
1. Teaching objectives are clearly defined.	3	7,5	3,17	7	3,5	13,20
2. Students' interests are encouraged.	10	5	1,72	11	12	14,90
3. Teachers are well prepared for their teaching.	1	3	5,03	3	2	12,56
4. Teachers are experts in their subject.	2	1	2,06	4	1	7,41
5. Teachers are enthusiastic for their subject.	11	11	1,62	8,5	5,5	12,53
6. Teachers emphasise important parts of the subject.	7	6	0,82	5	3,5	13,53
7. Teaching methods are used which encourage active cooperation by students.	12	12	1,33	12	13	14,01
8. Active and independent student learning is encouraged.	5	10	4,58	8,5	8	14,92
9. Teachers respect students' individual differences.	15	13	3,20	15	15	11,89
10. Teachers ask for feedback.	13	15	3,68	13	9,5	11,97
11. Teachers respond to students' feedback.	14	14	0,47	14	14	13,32
12. The assessment of students is fair and reliable.	4	2	0,81	2	9,5	17,05
13. Individual courses are designed so as to contribute integrally to a student's subject of study.	8	9	1,99	6	5,5	13,69
14. Books and other resources are available.	9	4	1,96	10	11	12,44
15. Teachers show readiness to help.	6	7,5	0,94	1	7	15,28

TABLE 4: MANN-WHITNEY U TEST (TEACHERS' AND STUDENTS' ASSESMENT OF "IDEAL" AND "REAL"; SIGNIFICANCE LEVEL Z=1,96; p<0,05)

Conclusions

Our results have shown statistically significant difference between "ideal" (assessment of the relevance and contribution of each criterion to successful university teaching) and "real" (assessment of the extent in which every criterion is respected in actual teaching at the university) according to the teachers in 9 criteria (from 15). The difference between students' assessment of "ideal" and "real" was statistically significant in every criterion.

Our opinion is that the most indicative result of our study could be seen when the assessment between "ideal" and "real" from the teachers' and students' side is compared. The results of Mann-Whitney U test show that teachers and students do not substantially differ when "ideal" teaching is assessed: the difference is statistically significant in 7 criteria (from 15). However, when we come to the assessment of "real" teaching, then the results are completely different: there is statistically significant difference in every criterion, and the test shows that the differences regarding some of the criteria

could be called radical (for example, for the fairness of teachers' assessment and their readiness to help).

A lot of questions concerning students reliability in the assessment of teaching could be put, that would prevent us from drawing firm conclusions from our results. What gives us the argument for taking students' assessment of "real" teaching seriously is the fact that the students and the teachers mostly agree when their vision of "ideal" teachers is examined. If we take students' assessments in this part as reliable, we may do the same when the "real" is assessed. We believe that students' assessment in this case could be understood as an indicator that teaching at this university does not - to a sufficient extent - respond to the quality criteria, and is not favouring the students. We consider that our results must be taken as a serious warning that some actions for the improving the quality of university teaching should be taken. This study is to be followed by examining teachers' needs in the improvement of teaching and establishing the process of the improvement of teaching at the universities as a continuous process.

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TECHNOLOGY AND SPECIAL EDUCATION – WHAT ROLE DO THEY PLAY IN TEACHER EDUCATION:ISSUES, PERSPECTIVES , AND A MODEL.

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Teacher education programs have been and continue to be the subject of much concern throughout the world. One only needs to conduct a cursory search of the professional literature or to surf the Internet to gauge the interest in this topic. Much time is spent debating the merits of different approaches, the value of subject matter knowledge, the role of practice, the importance of methods, and sundry other topics. There has been no resolution of these issues.

This paper will focus not directly on those issues but will address two emerging issues: technology and children with special educational needs. The former topic transverses all subject matters and the latter arises from changing perspectives on placement particularly the issue of inclusion. Knowledge regarding both areas will be of paramount importance for teachers in the 21st. century.

The discussion of these issues will include particular reference made to the context and culture of teacher education programs. The rationale and a model for the inclusion of the areas in a teacher education program will be presented.

Over the years teacher education has been the subject of much criticism and the focus of many debates. If one is to search the Internet or do a review on teacher education, one finds a myriad of articles that speak to this issue. These articles often are scathing indictments of the current state of teacher education or have as their focus a specific program or plan. Although much of this criticism is well meaning and often rooted in deep convictions, it is almost to the point of overkill. Debating an issue without offering concrete and realistic solutions is a fruitless activity which basically spurs more debate and then a response. While this type of activity might well be quite exhilarating and intellectually challenging, it often has little effect on the day to day activity in a classroom. In fact there are times when the teacher education community might be spending too much energy on debating the state of teacher education rather than practicing and perfecting their craft.

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Teacher education and education in general in the United States has been thoroughly dissected and many proposals have been put forth to address the problems. Sizer's works (1984,1992) and Goodlad's works (1990,1994) are examples of critiques that have specific proposals that speak to what education should be about and what teachers should be prepared to do if student needs are to be met. Shulman (1987) and Wise (1992) have spent much time and energy discussing the problem and putting forward suggestions for reform. Smith (1980) offered a total redesign of teacher education. The work, effort, and contribution of the Holmes Group (1986) is recognized and raises many serious issues. Much of the material has criticized teacher education programs as lacking in rigor and not fulfilling the promise to prepare teachers to meet the needs of the youth of today. Proposals have been put forth to eliminate undergraduate programs, doing away with all teacher education programs , extending teacher education into a fifth year with that being a professional year, and requiring a master's degree to teach (Chiang and Green, 1995). At my institution there is discussion about having a three years of study that focuses on general education requirements and subject matter specialization with the fourth and final year of the Bachelor of Education being a professional year. This parallels the fifth year scheme mentioned above. These examples speak to the different perspectives that are held regarding teacher education. While acknowledging the issues involved in teacher education and their importance, the focus of this paper is not on radical surgery but rather will focus on two emerging issues: technology and children with special educational needs.

Teaching involves many activities and much skill. The role of a teacher is to teach in the broadest and most inclusive meaning of the word. While these two statements might appear to be simple and jingoistic on the surface , they do address the core of the problem of today's education. That is how we can most efficiently and effectively prepare individuals to meet the challenges of teaching and what are the scope of these challenges. No matter how we structure teacher education programs it is obvious that to be effective in their primary role of teaching teachers need a comprehensive knowledge base. Teachers must be competent, skilled, flexible and personable (Aladejana and Alao, 1993). Grossman, Wilson and Shulman (1989) maintain that subject matter knowledge is not enough. Prospective teachers must be able to transform their subject knowledge so that it can meet the needs of the students and be pedagogically defensible. To be effective teachers need to be able to "transform their knowledge of subject matter into instructional

representations"p.32. Even though teachers have a strong knowledge base of their subject, Mc Diarmind, Ball and Anderson (1989) assert that they must be able to relate this knowledge to areas outside this base. Orenstein(1991) maintains that teachers to be effective need to a body of knowledge which they then can apply in the classroom. The issue of teacher effectiveness and its complexity has been addressed by Cheng (1995). He asserts that the traditional analyses of effectiveness and the bench marks used to determine same are inadequate in dealing with the complexity of the issue.

The relevance of subject matter and the debate over effectiveness of teaching certainly have far reaching implications for teacher education. How do we present the material, what is the depth of knowledge required of the teacher, and what do we teach are related to curriculum and instruction, methods and material, and depth of subject knowledge. There can be little justified disagreement that learning how to teach, how to organize material, what to teach, should be essential elements in any teacher education program. Likewise the importance of understanding the nature of learning, the structure of the school system and an appreciation of the characteristics of the individual learner is undeniable and must be considered essential to any teacher preparation program. Goodlad(1990) discusses these subjects and maintains that they are necessary if we are to be effective in training teachers for today's schools. It is clear that teachers need to have wide-ranging training that encompasses not only being educated in subject matter but also how to teach, the teaching environment, and the characteristics of students, and how they learn.

There is some question as to whether or not preparing future teachers can be successfully completed in four years in the United States or two or three years as is currently the case in Hong Kong. The answer to this question is probably no. In Hong Kong the government is moving towards requiring teachers to have a Bachelor's degree. In the United States some states e.g. New York require a master's degree before permanent certification is issued. What can be accomplished in two, three or four years is merely a beginning. Teacher education should not be considered ended upon completion of a bachelor's degree or certificate program. Pang and Cooke (1993) address this issue through their description of an induction year. In fact teacher education and the education of teachers should always be considered as constantly evolving with the only constant being the continuing education of practicing teachers and administrators (Lyon, 1996). If there is not a continuing upgrading of knowledge and skills, the needs of pupils in the society of today and the future cannot and will not be satisfactorily met.

The focus of this paper is on pre-service teacher preparation programs; however, it should be noted that the concerns addressed here also need to be met by teachers in service. In fact the need to understand technology and the needs of children with Special Educational Need (D.E.S., 1978) is as great a challenge and of the same importance for those in the teaching profession as it is for those who have not yet entered the teaching profession. This will not be addressed in this paper but the implications for such upgrading cannot be overlooked nor minimized. Lyon (1996) has posited that teacher education programs should have many components including liberal arts, leisure, technology, research and pedagogical studies including theory and practice.

It might appear that two disparate issues are being addressed in this paper, technology and SEN. This may not be the case if we look at these as reflective of today's society. Both of these issues are becoming increasingly important as social issues. Kwok (1997) describes education as a form of social practice. Let us deal first with SEN and then with technology. If we accept Kwok's premise, we only need to look at the current situation in education whereby there is a clarion call to integrate SEN children into regular classes. Crawford (1997) presents a review of this using Hong Kong as a focal point. It is interesting to note that in his analysis. he points out very clearly that there appear to be some inconsistencies in the actions of the Government as opposed to their policy statements. "It is clear that there is a difference in Hong Kong between the rhetoric of integration and inclusive schools and what occurs in practice. How can we account for this apparent paradox?" p.183. Whether the actual implementation of integration occurs full bloom in any school system, the fact remains that the teachers who are going to be charged with educating these youngsters need some background. If we are committed to training teachers for the new millennium, we must prepare teachers who can meet the educational challenges of the age. This simply means that notwithstanding the debates that will continue to rage over integration that teacher education programs must adapt to this social movement.

The philosophy that guides the response to this social movement should mirror the philosophy of the movement. The basic philosophy is to minimize but respect differences in all people with the basic premise that individuals have a right to be educated with their peer group and not be separated from same on the basics of accidental differences which often reflect societal prejudices and lack of knowledge.

It would only stand to reason then that a teacher preparation program that segregated the topic of SEN and set up special modules or courses for its teachers was going against the philosophy of inclusion and in essence

reinforcing the stereotypical perception that in order to deal effectively with Special Educational Needs children in the regular classroom you need specialized and segregated training. This is simply not the case. In point of fact it has been stated that the bulk of SEN children can be found in regular classrooms (Crawford, 1997) . If this be the case and teachers somehow have managed to survive and students to benefit from their education, it would stand to reason that instead of drastic surgery on existing teacher education programs, certain modifications might be made that would equip regular education teachers with greater skill in teaching the SEN student in their classroom. It may be in many classrooms that the only obvious difference might be that the teacher is more fully aware of the fact that some of the students might have been in special classes before and have a label. The behaviors of the SEN student both socially and academically may only be minimally different from some of the students in the regular class. In this case if the teachers were able to overcome their preconceived notions regarding SEN students then life in teacher education could go on without significant changes in the curriculum. Unfortunately experience tells us that this is not the case. Teacher expectations will most surely come into play and this will have to be addressed if effective education is to occur.

There may also be some SEN students who present significant challenges to the classroom teacher, who is not prepared to meet the needs of a student with severe special educational needs. This may be a child who is both deaf and blind, a student with a severe reading disability, a youngster who has Attention Deficit Disorder with or without Hyperactivity. It is a fact that traditional programs do not address these issues fully. The question then arises as to how we can address these problems without setting up a separate education program or watering down existing curriculum. The answer to this question is that a two-front attack needs to be made. First, even though many special educators would resist the idea of a survey course(s)/module(s) on the grounds that it violates the philosophical principles put forth above, there is, in this author's belief, a time when the needs of students and teachers might take precedence over the stated philosophy if the philosophical stance interferes with the student's right to an education in the least restrictive environment. Second, there is absolutely no reason why a course(s)/module(s) that deals with particular needs and characteristics cannot be developed in a manner that is both sensitive and informative as well as meeting the needs of classroom teachers. We have a precedence in the United States when whole curricula were developed to deal with minority groups; Black and Puerto Rican Studies. This appears to have increased understanding and dispelled some myths. Students might also be able to access this material through self-study packages

that are part of another module that currently exists in the curriculum. It cannot be that these self study packages are part of a "laundry list" of options but rather must be compulsory for all students. Again the material would have to informative and carefully constructed so as not to exacerbate preconceived ideas but to broaden students' understanding and skills.

The second approach could be classified as the whole curriculum approach or the integrated approach to SEN. Depending upon the type of institution and the role that liberal arts or a core curriculum plays in the education of students, this approach might affect the whole student body. Our proposal would parallel the writing across the curriculum approach. Basically it is our contention that the broader issue of society's response to and treatment of SEN individuals has implications for the content of all areas of the curriculum especially in core or Liberal Arts courses. If one is considering Philosophy /, the ethical treatment of disability is a common theme in both eastern and western philosophy as well as such topics as the goodness and educability of humankind; Economics /, the economic implication of disability; Sociology-labeling and deviance theory; Literature-The Hunchback of Notre Dame. It would not be difficult to review most curricula and without forcing the issue show how logically and naturally that SEN could easily be included. The curricula would still be able to meet the stated purposes but it would help all students be more cognizant of and sensitive to SEN people.

In dealing with pedagogical courses/modules, it is very clear that there is no good rationale for not adapting the curriculum and modifying teaching content to address the real need of most prospective teachers of being equipped to teach the SEN student whether the student is newly integrated or has been in the classroom and not officially classified. The argument that I do not want to be a special education teacher so don't force me is not sound. As pointed out earlier (Crawford, 1997), most teachers will encounter SEN students in their classrooms as a matter of course. It is only logical and pedagogically sound that future teachers be given the necessary information regarding the particular needs of SEN as part of the context and culture of the environment in which they will be teaching them – the integrated classroom. Failure to recognize this is very significant and counter to the prevailing social and educational movement in many of the countries of the world. It is also the contention of this author that the responsibility for delivering the content of these course(s)/module(s) lies not with the Special Educator but with those charged with teaching the various course(s)/module(s) and the respective curriculum committees in the various academic departments. This issue of faculty expertise and their role will be addressed more fully after technology's role has been discussed.

The issue of the role of technology in teacher preparation programs is much less clear than that of SEN students since there does not seem to be a compelling social issue that would serve as a driving force for curriculum change. In fact if anything there is an abysmal lack of knowledge as to what technology education is. Like most educators this author equated technology education with computers or teaching aids; overhead projectors, videos, etc. Raizen, Sellwood, Todd, and Vickers (1995) stated:

Too frequently ,when people hear the word "technology" in connection with school they think of computers in the classroom. Technology education is more than that. It is a new subject area that can help students learn about the world around them and help them integrate what they learn in the other subjects they pursue, thus adding relevance to their studies. While computers in the classroom can play a role teaching technology, they are no more specifically linked to technology education than they are to any other subject. ... Inherent in the definition of technology education a model of how it should be taught. Students should not only study; they should do technology. (P. xv)

If we are to accept their premise, it appears as if there is quite evidently a compelling social reason to integrate technology education in its broadest sense into the curriculum of teacher education programs. In fact there are other social factors that need to be considered when looking at technology and developing a rationale for including it in teacher education programs. Volk and Yip (1997) found that significant differences exist between boys' and girls' attitude toward technology. Girls felt that both sexes should have access to technology. In reality girls had much less access to technology education even though by law they were entitled to equal access. In their recommendations, Volk and Yip call for changes in teacher education programs especially focusing on increasing knowledge and understanding of technology. Bensen (1995) in discussing the rapid changing state of technology in the world states that it is essential to today's teachers. "The education needed to be culturally literate today requires more than a causal measure of technological competence. In fact people are considered not to be well educated unless they understand the culture in which they live."p.19. Since we are in a highly technologically advanced society, being literate regarding technology is necessary to be considered literate. Those charged with ensuring a literate population are the teachers. If they are not literate themselves, then logically it follows that they will not be able to prepare a literate population.

It is quite clear that technology education presents a greater challenge for teacher education programs than providing information regarding SEN. There is little full understanding of technology in its broadest sense and less of its

importance and relevance to teacher education. As with the call for a two fold approach to SEN inclusion, the same would seem to be necessary for making technological education an integral part of teacher preparation programs. Technology covers a wide range of topics and subject matter and the less technical present less problems for curriculum revision. The use of computers in the classroom and similar technology can be found in many teacher education programs. There are many opportunities for students to use the Internet, e-mail, or electronic libraries. The teaching of computers or the use of computers in the classroom are offered in most teacher training programs. Often they are required courses. The same cannot in general be said of more advanced technology. Volk (personal communication, November 8,1997) indicates that transportation systems, construction, and other topics that define and are an integral part of technology rarely if ever see the light of day in teacher preparation programs. It is quite obvious that there needs to be a concerted effort made to determine where technology can become enmeshed into the curriculum across the core or liberal arts component of the teacher education program. This is not a difficult task but it one that needs to be considered and acted upon in order to ensure that the teachers of tomorrow are able to make their students literate. In the beginning of this section on technology it was stated that there were no obvious compelling social reason for integrating technology into the teacher education curriculum. In retrospect and considering the relationship of technology to a culturally literate society, there is not only a good reason but also a compelling social purpose to advocate for the inclusion of technology in all teacher education programs.

There is another reason that is obvious to anyone who works with the youth of to-day. They are technologically sophisticated. That is they are not awed by rapid changes in technology and often are more familiar with it than their teacher. We need to see how we can harness this knowledge and use it to make the classroom more user friendly.

This paper has presented arguments for technology and SEN becoming an integral part of teacher preparation programs as well as suggestions for how this may be done There are, however, concerns and issues that must be acknowledged and which could make the implementation or acceptance of this proposition difficult. The first issue concerns course ownership. Who should own the course and determine the content? Is it the subject matter specialist or is it the outside expert? At what point does the responsiveness to external and societal issues impact on academic freedom? These are extremely difficult problems and must be resolved. A second issue evolves around competence. Am I knowledgeable enough about SEN and technology to be able to teach it?

This is a really serious concern but one that can be resolved. A basic approach to resolving this be would to conduct a series of faculty seminars and workshops that are designed to enable staff to make their own adjustments to the curriculum. The Dean's Grants Projects (Bates, Schwartz, Ansfield, Lyon, and Lynch, 1981) in the United States are an example of this approach. There may also be the occasional need of using the "expert" as a guest lecturer or co-teacher. Creating self-learning multi-media packages is also a very viable and constructive approach especially in those Colleges and Universities where access to experts on technology or SEN may not be readily available.

Another issue that has serious consequences deals with the concordance between what is taught in the teacher preparation program and what is the reality in the schools. Should we be discussing the use of computers or technology when such are not available to the teachers now and do not seem to be available in the near future. This is an issue in developing countries and certain areas of developed countries. It presents a dilemma. If we do not address this, we cannot maintain that the teacher is a literate member of society and the teacher will not be equipped to teach their students about technology nor be prepared to teach SEN students. In either instance we have set up the proverbial vicious circle in that the lack a good teacher preparation program only reinforces the *status quo*. In turn the need to change teacher education programs is not seen as important. Thus little change takes place and inertia is the result.

The last issue deals with the narrowing of international borders, the information explosion and the speed of communication. Theories of education, social movements, and technological advances cross international borders like the wind covers the globe. Many times theories of education are propounded that have their roots in a specific culture and are brought to cultures whose heritage and history and beliefs are inimical to the tenets of the theory. We have a culture clash. This is obvious to all and the ideas put forth in this paper must be judged and adapted to those countries and areas that have either the social structure that supports the philosophic perspective put forth and where there is not an entirely different belief system operating. This paper has attempted to present a rationale for changes in teacher preparation and offer a few suggestions as to how this change can be implemented with the full understanding of the cultural relevance of such proposals. It is obvious that while dramatic surgery is not necessary to implement the proposed changes, a change of thinking on the part of those in teacher education may be necessary.

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A Suggested Plan to Improve the Quality and the Efficiency of Teacher Preparation in the College of Education at Abha

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A Suggested Plan to Improve the Quality and the Efficiency of Teacher Preparation in the College of Education at Abha

Introduction:

There is a strong relationship between teacher preparation programs and human resources development policies on which development plans depend in many countries around the world. This is due to the teacher's role as an implementor of the educational policies. Therefore, teacher preparation, training, and improvement in Saudi Arabia are a national responsibility and are the concern of different governmental agencies. This is in addition to colleges of teacher preparation, Ministry of Education, and General Presidency of Female Education.

Public and private educational institutions' performance depends on the efficiency of teacher education institutions' output, primarily colleges of teacher preparation and specifically colleges of education. Based on this argument, the study came up with two plans for the purpose of improving the quality of the college of education at Abha which faces a struggle between the scientific and the literary specializations on the one hand and the educational and professional preparation on the other. This contradiction led to the decline in quality and efficiency of its graduates, who are not up to the level of the national expectation.

This paper suggests two plans aimed at improving the quality of the graduates from the college of education at Abha in accordance with the contemporary study plan applied at the college.

Historical Review:

Over the years, old communities had developed some kind of teacher preparation programs which were not necessarily similar to the contemporary programs that are known in different part of the world. Community leaders used to train some individuals to perform certain skills and to learn some values, so they could transfer these skills and values to the youngsters of their time. In the world's major religions (Judaism, Christianity, Islam and others) the worship place (synagogue, church, mosque, temple, etc.) has been used to educate, train, and prepare teachers to teach the faith in addition to reading and writing. Not only this, but also religious communities have played a major role in establishing educational institutions that are well known today as the oldest and the best universities in their countries. To mention a few of them, Al Azhar in Cairo, Oxford in England, Harvard in America and the Sorbonne in France.

Islam came as a continuation of the previous messages which were taught by the prophets and messengers of God (Allah). The first commandment from Allah to his messenger Mohammed (SAW) read.

1. Read! In the name of your Lord, Who has created (all that exists).
2. Has created man from a clot (a piece of thick coagulated blood).
3. Read! And your Lord is the Most Generous.
4. Who has taught (the writing) by the pen
5. Has taught man that which he knew not (Holy qur'an 96:30).

This declaration for the importance of knowledge in Islam was followed by the prophet's teachings in which he ordered Muslims to seek knowledge.

"Seeking knowledge is an obligation upon each Muslim" (male or female) (Al Ghazali, p.2).

One should ask why seeking knowledge is mandatory upon each Muslim and is equal in its obligation to prayer, fasting, and paying charity (Zakah 2.5% of a person's wealth to the needy)? It is because the Muslim is accountable after death and will be questioned about his/her youth, age, wealth, and knowledge. Furthermore, the Muslim's death marks the end of his relation with earthly life (deeds) except for "a continuous charity, good son/daughter who will pray for this parent(s), and a useful knowledge", as the prophet said. Therefore seeking knowledge in Islam is a very important matter and is considered an obligation and not a mere personal right, as seen in different societies around the world.

From the preceding presentation, Muslims have acknowledged the importance of knowledge and have established a variety of educational institutions beginning with the mosque, halaqah, kuttab, zawyah, and madrasah. Many studies (Totah, 1926; Dodge, 1962 and Stanton, 1990) about education in Islamic societies emphasized the status of teachers and how they got their training before they become teachers in the mosque, kuttab, and madrasah. Authors point out that each one of these institutions graduated teachers who had to continue teaching in the same institution or in another one. Qualification was known in Islamic education and was called "Ijazah". Teachers had different titles which differentiated them according to their level of education.

Due to the expansion of Islamic education, new teaching positions were created in the mosque. Stanton (1990) gave an explanation for the different types of teaching staff and duties of each type:

> The madarris took on the religious function of the imam in addition to his duties as instructor and administrator of the mosque-college. Where the

> finance permitted, the masjid expand its staff by employing associate instructors, repeaters, and tutors. The associate instructor (naib) substituted for the mudarris if the latter were occupied with other matters connected with the administration of the mosque-college. The repeater (muid) was trusted with repeating the lectures to student who could not hear them or were absent from the session and also gave private help to the students having difficulty with their studies. The tutor (mufid) assisted younger or less advanced students, but was not yet judged capable of repeating the lecture (Stanton, p.33, 1990).

Learners who had the ability to teach were usually authorized to practise teaching. Qualified students were mostly recommended to establish their new kuttabs or join other mosques where they could teach. Some students sought official authorization from their Shaikh to certify their abilities to teach certain subjects. The Shaikh would write a letter of recommendation indicating his recognition of the student's capability in mastering the notes that were given to him, and that he could teach from those notes. He could use the letter as a reference in a place where he was not known. These types of letters were known among the Muslims and were called (Ijaza) which means permission or certificate. It was issued in response to the student's request:

> If he desired some formal recognition for his acquisition of knowledge, the equivalent of certification or a diploma, he could ask for and receive a letter from the Shaikh stating that his copy of the master's notes was accurate and that he had developed the requisite skills to teach others from his copy of that specific work. Such a letter, the ijaza, proffered a form of license on the owner in the same way that the letter from a Shaikh in a mosque-college or madrassah did so for a student in a female institution of higher education (Stanton, p. 124, 1990).

In comparison to the Muslim's contribution, in the west, teacher preparation has gone through different stages and has occupied an important position among the religious community there:

> In Medieval and Post-Reformation Europe, for example, there was considerable concern with the qualifications and background of teachers, mainly but not entirely with reference to their religious beliefs. In 1559 Queen Elizabeth I of England issued an injunction that prohibited anyone from teaching without a license from his bishop, which was granted only after an examination of the applicants "learning and dexterity in teaching", "sober and honest conversation", and "right understanding of God's true religion". Thus the certification of teachers and concern for their character and personal qualities are by no means new issues (W.Ta.p. 440, 1989).

Germany is known as the earliest country to have formal arrangements for teacher preparation, which goes back to the early part of the 18the century. Normal schools (teacher preparation programs) were known to the United States, Britain, France, Belgium, and Japan during the nineteenth century. The dramatic progress in teacher preparation began late 19th and early 20th century where new methods and curriculum were introduced for the first time. Debates among scholars and theorists about the best strategy for teacher education were very popular. The 20th century has witnessed worldwide advancement in the area of teacher education (beyond the traditional normal school) which has been influenced by social, political, economical, demographic, and technological changes:

> More recently there has been a widespread movement away from the types of training described here as Normal School A and B to the college and university patterns. But the fact a country has adopted what has been called here the university pattern of training should not be taken to mean that all the institution in which teachers are prepared are comparable to the pre-existing universities; some are devoted mainly to teacher preparation (W. Ta.p.443, 1989).

Universities started specialized research colleges called colleges of education similar to the other university; colleges like medicine, administration, arts, and others. In addition to conducting research, colleges of education prepare teachers as an integrated (Takamoly) system where students have to take specialization courses and a combination of educational and professional courses (education, general, and teaching practice). Due to the importance of research in colleges of education, graduate studies leading to the master and the Ph.D. degrees are introduced. Another system is called consequential in which the student will get the specialization training in the specialized college, then joins the college of education to get the educational and professional preparation for one year or more where he/she has to receive a certificate which will allow him/her to practice the teaching profession.

Types of teacher preparation programs:

There are two types of teacher preparation programs at the university level which differ from one country to another and from one educational institution to another as shown in tables (1) and (2). One should understand that countries in different parts of the world differ in terms of history, economy, politics, and culture. These factors influence in many ways the type of program which is used by each country. Furthermore, the philosophy of education is not necessarily the same, and educators and policy makers plan education in accordance to their national need. Some countries have demographical problems which have direct influence on the governments choices. That is why some countries have different types of programs. I should point out that, the increase number of years is not necessary an important indicator for better quality in teacher preparation programs.

Lower and Upper Secondary Teachers Years of Study for European Countries
Table (1)

Country	Lower Secondary		Upper Secondary	
Country	1990	Remarks	1990	Remarks
Belgium	3	Concurrent	4-5	Includes pedagogical course
Denmark	4	Concurrent	5-6 (+1/2)	Degree + Paedagogikum
France	3-4 (+1+1)	Degree + (preparation) + induction after 1992-93: 3+2 (IUFM) and apreges 4+(1)+1	3-4 (+1+1)	Degree + (preparation) + induction after 1992-93: 3+2 (IUFM) and apreges 4+(1)+1
Germany	3-4 (+2) 4-5 (+2)	Haupt/Realschule Gymnasium studies are in two phases	3-4 (+2) 4-5 (+2)	Haupt/Realschule Gymnasium studies are in two phases
Greece	4-5	Includes pedagogical courses	4-5	Includes pedagogical courses
Ireland	3-4 (+1)	Degree + higher diploma in education	3-4 (+1)	Degree + higher diploma in education
Italy	4-6	Degree, after 1993-94 also pedagogical studies	4-6	Degree, after 1993-94 also pedagogical studies
Luxemberg	4-3 (+3)	Degree + professional phase	4-3 (+3)	Degree + professional phase
Netherlands	4	Grade 2 includes teachers training course Grade 1 degree + teacher training course	4-3 (+3)	Grade 1 degree + teacher training course
Portugal	5	Mostly includes pedagogical element	5	Mostly includes pedagogical element
Spain	5+1	Degree + teaching proficiency course after 1993 5 (LOGSE) pupils age range 14-18 to 12-18	5+1	Degree + teaching proficiency course after 1993 5 (LOGSE)
United Kingdom	3-4 4	PGCE degree + education studies, lower secondary Studies mostly Bed, concurent	3-4 (+1) 4	PGCE degree + education studies, upper secondary Teachers mostly Bed, concurrent

Source: European Trade Union Confederation, 1996

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Duration of Secondary Teacher Education Course in 24 Countries of the World in 1984-85
Table (2)

Asia		Africa		South America	
Country	Duration	Country	Duration	Country	Duration
Afghanistan	4	Algeria	4	Brazil	1
Pakistan	3	Ghana	3	Chile	5
India	4	Nigeria	3	Cuba	4/5
Sri Lanka	3/4	Ivory Coast	1	Peru	3
Bangladesh	1	Morocco	4	Venezuela	4
Nepal	1	Kenya	3	Colombia	4
Thailand	4	Sierra Leone	1		
Malaysia	4				
Singapore	1				
Indonesia	5				
Philippines	6				

Source: Rust, 1990

First: The University Level (Four Years)

There are three forms of teacher preparation programs at the university level and each one has its own organizational form and philosophy of educational and professional preparation for the teacher.

A. *Four years:* The student is admitted to start his study with the university, college, and department course requirements; then he continues his specialization studies until he finishes the program.

B. *Three years and one year:* The student studies for one year in either general or specialized courses before his formal acceptance in the professional program of teacher preparation. In this type, specialized and professional study starts from the second year until the end of the program.

C. *Two and two years:* The student is admitted into this program to study the core courses for two years; then he will be permitted to continue his studies in the specialization courses. This type of program represents the junior colleges for two years, followed by two years in the four year colleges where the student will receive the bachelor degree.

Second: Five year programs consists of two types:

A. *The first type:* The student in this program is required to study for a duration of five years, leading to the bachelor degree in education after a fifth successful year. Sometimes after finishing four years, the student receives a higher diploma by the end of the fifth year.

B. *The second type:* Students admitted to this program are required to obtain the bachelor degree. They are prepared for one year in the educational and

professional courses, as well as, field practice. By the end of the fifth year the student receives the master certificate or higher diploma in accordance with the philosophy of each program.

Towards better quality in the College of Education at Abha

Since 1976-77, the college of education at Abha has graduated 4487 teacher (until the end of the academic year 1996-97) for the purposes of meeting the massive expansion in public education mainly in the intermediate (Junior high) and the secondary (Senior high) schools. During the first ten years, the college was oriented to graduate as much teachers as possible, but the last ten years have witnessed a huge demand from applicants who see security and stability in teaching compared to other professions. Due to these developments, the student enrollments have drastically increased; 3506 students in the first semester of the academic year of 1997-1998 compared to 52 students in the first semester of the academic year 1976-77. This led to inflation in the number of students in the History, Geography and Biology departments compared to other departments as shown in table (3). This is one of the main causes for the low quality in these specializations in the college of education at Abha.

The number and percentage of students in the college departments for the second semester of the academic year 1996-97

Table (3)

	Student No.	Percentage
Science Departments:		
Biology	498	15.9
Physics	207	6.6
Chemistry	392	12.5
Mathematics	333	10.7
Literary Departments		
History	573	18.3
Geography	507	16.2
English	317	10.2
Psychology	299	9.6
Total	3126	100

In reality, College of education at Abha consist of three colleges (education, science, and literary) incorporated into one system which aims at preparing teachers in the literary and scientific specializations to teach in the intermediate (junior high) and secondary (senior high) schools. As shown in table (4), the study plan of this college follows the integrated system (takamoly) where the student has to take mixed courses from different areas to include specialization courses, general requirement, educational and professional courses in each semester. It is also divided into eight levels (semesters) for four years, requiring

the student to pass 128 hours in the literary departments compared to 126 hours in the scientific departments. Such policy has helped students to proceed in the program despite their poor quality or failure in the specialization courses, while passing in the general, educational, and professional requirements. This fact was realized when the results of the final examinations of the third level (semester) for the academic year 1996-97 was analysed and shown in table (5).

The study plan for the Chemistry Department

Table (4)

First Semester (level 1)			Second Semester (level 2)		
Course No.	The Course	Hours No.	Course No.	The Course	Hours No.
101 Isl	Int. to Islamic Culture	2	102 Isl	Islam and society	2
101 Ara	Arabic (1)	2	103 Ara	Arabic (2)	2
101 Edu	Educ. I Foundation	3	152 Psy	Educ. Evaluation	2
102 Eng	English	3	101 Mat	Defe-Int-(1)	3
101 Che	G-Chemistry (1)	4	101 Phy	Intro. to Physics	4
101 Bio	G-Biology	4	103 Che	G-Chemistry	4
	Hours Total	18		Hours Total	17

Third Semester (level 3)			Fourth Semester (level 4)		
103 Isl	Economic-Sy in-Islam	2	104 Isl	Political Sys in Islam	2
111 Educ	Educational Research	2	321 Edu	Comparative Educ.	2
221 Psy	Educ-Psychology	3	230 Cur	Curriculum	2
114 Mat	Def-Int-dif-Equation	3	230 Che	Physics-Chem. (1)	3
245 Che	O-Chemistry (1)	4	246 Che	O-Chemistry (2)	4
251 Che	Analytical-Chemistry	3	252 Che	Ana-Chem-Volume	3
221 Che	Chemistry of MGE	2	211 Che	Quantum chem.	2
	Hours Toal	19		Hours Total	18

Fifth Semester (level 5)			Sixth Semester (level 6)		
260 Cur	Environmental Edu	2	241 Cur	Edu-Technology	2
352 Edu	School Administration	2	353 Edu	Edu-Supervision	2
231 Che	Phys-Chem (2)	2	331 Che	Chem. Rinetics	4
334 Che	Lab-Chem-Phys	2	344 Che	O-Chem (4)	2
343 Che	G-Chem (3) Phys	2	360 Che	Biochemistry (1)	3
325 Che	Grav-Ara-Chem	3	322 Che	NU-Chemistry	7
321 Che	Chem-Trans-Elem	4	345 Che	Lab-O-Chem	2
			333 Che	Photo-chemistry	2
	Hours Total	17		Hours Total	19

Seventh Semester (level 7)			Eight Semester (level 8)		
354 Cur	Science Edu	2	476 Cur	Teaching Practice	12
332 Cur	Physics Chem (3)	2			
346 Cur	Lab-O-Chemistry	2			
423 Che	Spectroscopy	2			
444 Che	Org-Chem (5)	2			
421 Che	Organo-Chem	2			
451 Che	Instru-Analysis	3			
422 Che	In-Orga-Chem	1			
	Hours Total	16		Hours Total	12

The result of the final examination for the third level 1996-97
Table (5)

Specialization		Grading Scale Pass					Fail		Student
Specialized	Course No	A	B	C	D	Pass total	Fail	F. Tot.	Total Percentage
Mathematics	161 Math 171 Math 241 Math	1 .49	10 4.9	30 14.7	72 35.3	113 55.4	91 44.6	91 44.6	204 100
Physics	162 Phys 212 Phys 250 Phys 310 Phys 221 Math	0 0	6 6.6	12 13.2	31 34.1	49 53.9	42 46.1	42 46.1	91 100
Chemistry	114 Math 245 Chem 221 Chem	1 .6	14 8.4	23 13.8	56 3.5	94 56.3	73 43.7	73 43.7	167 100
Biology	105 Bio 211 Bio 351 Bio 243 Bio	2 .8	13 5.1	36 14.1	122 47.8	173 67.9	82 32.1	82 32.1	255 100
History	242 Hist 311 Hist 171 Hist	1 .4	44 19.2	121 52.8	45 19.7	211 92.2	18 7.8	18 7.8	224 100
Geography	231 Geoge 321 Geogr 373 Geogr	0 0	6 2.8	56 18.4	112 36.4	174 57.0	130 43.0	130 43.0	304 100
Psychology	120 Psych 210 Psych 251 Psych 291 Psych	3 4.2	10 14.1	16 22.5	26 36.6	55 77.4	16 22.6	16 22.6	71 100

Specialization		Grading Scale Pass					Fail		Student
Specialized	Course No	A	B	C	D	Pass total	Fail	F. Tot.	Total Percentage
English	115 Eng 181 Eng 213 Eng 216 Eng	5 2.3	25 11.6	42 19.4	89 41.2	161 74.5	55 25.5	55 25.5	216 100
General and	103 Islam	6 1.8	34 10.3	86 26.1	139 42.2	265 80.4	64 19.6	64 19.6	329 100
educational	111 Edu	2 .56	22 6.2	131 36.8	170 47.8	325 9.3	31 8.7	31 19.6	329 100
requirements	221 Psych	2 .6	53 15.9	103 30.9	126 37.8	289 85.2	49 14.8	49.8	333 100

Furthermore, the graduate results for the academic year 1996-97 is another indicator for the low quality of the teachers who graduated from this college as shown in table (6).

Total number if graduates and their GPA in each department

Table (6)

Departments	GPA				Student number	Percentage
	A	B	C	D		
History	0	9	40	20	69	22.7
Geography	0	1	18	16	35	11.5
English	0	2	21	17	40	13.2
Psychology	0	1	7	8	16	5.3
Mathematics	0	4	19	25	48	15.8
Biology	0	7	40	49	96	24
Chemistry	0	4	28	38	70	23
Physics	0	2	11	13	26	8.5
The Total		23	144	137	304	100%
Percentage	0	7.6	47.4	45	100%	

Improving the quality:

There are many elements that are involved in the process of improving the quality of teacher preparation in the college of education at Abha.

First: The students who usually join this college are chosen according to their point average in the secondary certificate, where the minimum

requirements for admission is 80% of the total grades. Starting from the first semester of the academic year 1997-98, students are required to attend the admission examinations that are given by the college of education. Besides the exam, there are oral interviews for the students in order to decide their specialization and to make sure that they don't have any health problems. This is a very good step to choose the best students from the applicants.

Second: The faculty members are expected to improve their skills and methods of teaching. They need to learn how to design exams, prepare a lesson, use the audio visuals, activate the student and manage the classes (lectures). Many universities are aware of this weakness and instruct their faculty members to attend specialized workshops for teaching skills. Furthermore, teacher performance needs to be evaluated by the departments, the administration, and the student. It is very important to hear from students about the problems in their teaching staff on different issues that are beyond the reach of the department or the administration.

Third: Curriculum evaluation has to be considered from time to time to fit the general and the specific objectives of the course. They should be updated with the last information in each subject. Also, selection of the subjects to meet the need in the work place is a fundamental issue, especially in the case of teacher preparation programs like the college of education at Abha.

Fourth: Some departments seem to forget the purposes of their programs and orient their courses to prepare functionalists rather than teachers in high and intermediate schools.

The First Plan:

Stage 1: College of education at Abha is a combination of three colleges (education, science and literature). To overcome the duality of preparation between the specialization and the educational and professional departments, it is logical to adopt type two in the five-year programs in which the student will be specialized for four years in the literary or scientific colleges to obtain the Bachelor Degree (B.A.), then continue his educational and professional studies for one year to receive high diploma in teaching. In the college of education at Abha, the student is admitted to the college and joins his department of choice to start his specialization courses without interruption by other courses from other departments for three continuous years. The student must register 16 hours or more each semester, until he successfully finishes 97 hours in his specialization.

Stage 2: A major condition for the student to continue in the program is to have a grade point average of 3.5 out of 5 as a prerequisite to enter this stage. At this level, the student will be given educational and professional knowledge which should contain different subjects that are necessary for the future teacher to know. During the seventh level (semester), the student must register 17 hours in the education and professional departments. For this stage, there are two options that should take place and according to the reform in the number of hours for the teaching practice as shown in table (7).

Courses for the Seventh level (Semester)

Table (7)

Choice A			Choice B		
Course No.	Title of the course	Hours No	Course No	Title of the course	Hours No
101 Edu	Educational foundations	3	101 Edu	Educational foundations	3
111 Edu	Educational research	2	111 Edu	Educational research	2
351 Edu	Comparative education	2	351 Edu	Comparative education	2
352 Edu	School administration	2	352 Edu	School administration	2
353 Edu	Educational supervision	2	353 Edy	School administration	2
230 Cur	Curriculum	2	360	Educational environment	2
353 Cur	Teaching methods	2	230 Cur	Curriculum	2
101 Com	Computer introduction	2	353 Cur	Teaching methods	2
	Total	17		Total	17

Stage 3: The number of hours of teaching practice varies from one college of education to another in the Kingdom of Saudi Arabia as shown in table (8).

Number of hours for teaching practice

Table (8)

Colleges of Education:	Madinah	Ahsa	Taif	Makkah	Riyadh	Abha
Hours	6	8	4	4	12	12

College of Education at Abha has 12 hours for teaching practice where the future teacher has to spend one semester, usually the eighth level (semester), in public schools. Based on the above suggestions, it is necessary to modify the eighth level (semester) to direct the student to take practice teaching in addition

to other courses from the department of curriculum with the total of 14 hours and according to one of the choices that are included in table (9) to meet the choices in table (7).

Courses for the Eighth Level (Semester)

Table (9)

Choice A			Choice B		
Course No.	Title of the course	Hours No	Course No	Title of the course	Hours No
475 Cur	Teaching practice	5	475 Cur	Teaching practice	6
Cur	Micro teaching	3	Cur	Micro teaching	3
241 Cur	Education Technology	2	241 Cur	Education Technology	2
102 Com	Introduction to Computer	2	101 Com	Introduction to Computer	3
360 Cur	Environmental education	2			
	Total	14		Total	14

This structure is designed because of the practice teaching which occupies a broad space in the study plan and creates a confusion in the studying processes in public schools where the regular teachers take advantage of the practicing students (future teachers) to fill their positions in classes. Also, the general feeling among the public schools students, even in the elementary stage, is negative toward the practicing students (future teachers), because they are considered outsiders and not part of the school faculty.

Also, the teaching practice supervision is very difficult due to the huge number of practicing students and the challenge to keep up with the supervision process which is usually delayed by the absence of the practicing student on the excuses that are made up like giving exams or reviewing the previous subjects, etc.

In order to make the teaching practice more practical, it is very important to take the following suggestions into consideration:

1. Reducing the number of hours for teaching practice from 12 hours to five hours to fit choice A, or six hours to fix choice B as shown in table (8) for one or two days per week. The rest of the days should be spent in the college of education where the practicing student will take some courses that are part of his professional training.

2. The additional hours should be reserved for computer course(s) for four hours to meet choice A, or three hours to fit choice B. The computer is a course taught in the high school and there is urgent need to introduce it within the study plan in the College of Education at Abha.

3. The remaining three hours should be put for micro teaching which will help a lot in training the future teachers and should be associated with the teaching practice. Practicing students should prepare ideal lessons to present in front of both colleagues and the supervisor who should evaluate, correct, and criticize their teaching skills and abilities. This course will give the practicing student an idea about the curriculum that are used in the public schools and allow him to practice teach before he stands infront of the students in public schools.

The Plan in Summary:

This plan comes to meet the recommendations of the second conference for teacher preparation in the Kingdom of Saudi Arabia which was held in Omm-ul-Qura University (College of Education – Makkah 21-23/1413), mainly item no. 4 (pre-service quality preparation for teachers). This plan considers the contemporary study plan according to the college capacity and capability which aims to improve the quality of the student who is the main target in this academic process with all its systematic, administrative, human, and financial resources. Table (10) shows the distribution of hours according to each department and the amount of time needed for preparation (specialization preparation for six semesters followed by the seventh semester for curriculum and educational courses, and the eighth semester for curriculum and teaching practice).

The Second Plan:

If we are serious to achieve high quality of teacher preparation in terms of specialization, education, and professional knowledge in the College of Education at Abha, the college should either be developed into three independent colleges (education, literary, science) or impower the specialization departments to achieve their independence to graduate specialized students with the diploma or the bachelor degree in the literary or the scientific fields following these procedures.

Distribution of hours according to department and requirements

Table (10)

Semester	Courses	Phys	Chem	Biol	Math	Eng	Geog	Histo	Psych
First	Specialization	16	16	16	16	16	16	16	16
Second	Specialization	16	16	16	16	16	16	16	16
Third	Specialization	16	16	16	16	16	16	16	16
Fourth	Specialization	16	16	16	16	16	16	16	16
Fifth	Specialization	16	16	16	16	16	16	16	16
Sixth	Specialization and General	17	17	17	17	17	17	17	17
The total*		97	97	97	97	97	97	97	97
Seventh	Education and curriculum	17	17	17	17	17	17	17	17
Eights	Curriculum	14	14	14	14	14	14	14	14
The total		31	31	31	31	31	31	31	31
The general total		128	128	128	128	128	128	128	128

(1) Literary and scientific departments should prepare their students in the specialized knowledge for three years leading to a diploma in both the literary and scientific departments. This is if the students who want to continue professional training as teachers have a GPA of 3.5 out of 5 as a condition for admission to the fourth year which should lead to the bachelor degree in education. Those students who cannot achieve the required GPA, could either receive a diploma in their specialization or continue their studies in other colleges of King Saud University or Iman Muhamed University (especially for history and geography specialists).

(2) The specialized departments (literary and science) could graduate students with the bachelor degree in their specializations by adding more hours to the faculty members and by organizing or distributing the faculty positions equally among the departments. There is also a need for a few faculty members' positions to fill the job in very limited departments. Following this procedure will not require any administration responsibilities and these departments will be the core for new colleges in the future (science and literary).

* The scientific departments must have eight hours additional to the 97 hours which is shown in the table, where the student has to take some courses in the other scientific specialization to reach the total of 136 hours. This is because in the intermediate school students are taught general sciences. Therefore, the teacher of this course should have enough understanding about the different subjects (biology, chemistry, physics) that are included in this course.

(3) According to the assistant – vice minister of education, there are more graduates than needed in the working market, especially in history, geography, Islamic education, and physical education. Other specialists will be in the same position in a few years time. Based on this situation, it is very necessary for colleges of education to reduce the number of their graduates and start graduate programs to satisfy three purpose: (a) to improve the quality of the in-service teachers as well as pre-service teachers, (b) to limit the huge number of graduates, (c) support the research in education through the graduate studies programs.

Conclusions:

The suggested plans are set according to the study plan in the College of Education at Abha, and in order to solve the problem of poor quality of the graduates from this college, it is very necessary to consider the immediate reform: (a) the admission policy, (b) the number of students (c) the conditions of the faculty members, (d) the teaching methods, (e) the evaluation procedures, (f) the administration mechanism, (g) legislations and regulations, (i) the environmental structures: (1) buildings, (2) Laboratories, (3) educational technologies, (4) activities centers.

Finally, there is an urgent need to establish strong relationship between the college of education and the beneficiary institutions like the Ministry of Education and the General Presidency of Female Education.

The adaptation for these recommendations will allow the departments to control the quality of their students and to get rid of the unqualified students. I suggest also for the Ministry of Education not to employ any graduate from the college of education without a letter(s) of recommendation from the college indicating that he is qualified teacher for the likely post.

Above all this, to achieve a better quality in education, there is a strong demand for reform and innovation in teacher education at the Kingdom of Saudi Arabia, in general, and at the College of Education at Abha, specifically. Therefore, decision makers must take these two plans into careful consideration and study them in a broad perspective, taking into account the future needs in the eve of the twenty first century.

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Promoting Quality Teacher Education for an Interconnected World

With reference to

Promoting Professional Qualities of Teachers and Teacher-educators

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It is said –

"Preservation of the basic
elimination of the old and
addition of modern ideas,
tested on the anvil of practicability and
teasibility in the universal phenomena
at the International Canvas
would improve the quality of teacher education
out to the size of individual needs and
demands of every country to achieve
the objectives of education"

How Very True!

One of the important milestone in the development of teacher-education curriculum was the Report of the Education Commission (1964-66). This Commission observed that a sound program of professional-education for teachers was essential for the qualitative improvement in education for which it recommended –

a) reorientation of subject knowledge,
b) integrated courses of general and professional education,
c) vitalising professional studies and basing them on Indian conditions through the development of educational research,
d) improved methods of teaching and evaluation which include self study and discussion and continuous internal assessment and sessional work.
e) developing special courses and programs, and
f) reviewing the curricula and programs at all levels of teacher-education to meet the requirements of the national system of education.

In the fast changing world around, the role of the teacher too, is changing so fast that any fixed amount of pre-service or in-service teacher education can hardly cope with the expectations of the society. The teacher, therefore, can no longer afford to remain a mere transmitter of Knowledge. Due to the fast expansion of educational facilities at all levels of education the teacher is expected to understand his role in all its dimensions and play it effectively in order to meet the challenges posed by the rapid growth in various branches of knowledge. Education being a life long process, demands the development of not only a school teacher but also that of a teacher-educator continuously through out his or her career. For this, the teachers as well as the teacher-educators have to welcome the new thoughts and trends entering in the field of education. They have to accept the change. No doubt, this is difficult. Most of us are more comfortable with the way things are or were than with the uncertainties of the future. However, it is also equally essential to bring about a change in the existing system of the supervision of the practice-teaching lessons of the B.Ed. trainees. Hardly 5% of the Teachers Training Institutions would think it worth while to spend the time and effort on the follow-up and research on the teaching performance of their pupil-teacher – truely speaking, very little feedback is received by the pupil-teachers on their performance. It is definitely correct to say that No matter how much a person practices at dart-throwing, he or she will get nothing if the target is kept hidden from one's view and receiving no feedback as to how he or she is doing. This, of course, is one of the examples cited here. It should be recognized that advance in education depends largely on the qualifications and ability of the teaching staff in general and on the human, pedagogical and technical qualities of the individual learners. Dr. N.K. Upasani, are of the eminent educationist in India, had once said in one of his lectures that "to see in order to foresee and to foresee in order to gain power is a sound advice to the prospective teachers. The training is absolutely necessary to develop required skills and competencies, so also for imbibing desirable attitude and love for the profession".

How very true! Teaching is one of the most reputed profession. Hence, it should attract the brightest minds and finest personalities with total sense of commitment. Since teaching is both a science and an art in itself, it provides the study of human minds and human actions. The progress of teaching requires the teachers to apply scientific principles in dealing with individual and group interactions. Besides sincerity and devotion to the profession, the teachers as well as teacher-education are expected to be very much innovative in the methodology of teaching of their respective subjects.

Tea er-Education:

Education today, is no more considered in isolation as a discipline; but it has to be considered in the context of social and national perspectives. The modern science has brought about new technology in education; and the prospective teacher needs to be exposed to all such facets of the society.

The preparation of good teaching rests upon the specialisation of the subjects to be taught, an understanding of educational process and teaching skills. In order to keep pace with the changing times, various theories of learning, various techniques of teaching, various psychological principles of learning, psychology of the learners, various researches in learning and teaching, various problems of adjustment, various current issues in education viz. adult-education, population education, etc. ___ all these have to be included in the broader framework of syllabus of teacher-education. It means, teacher-educators are required to be exposed to all the facets of the problems along with the modern development in science and technology. They have to be necessarily futurised in scientific and technological dimensions. Training is a must for them for the development of required skills for their jobs. Nay, professional training, refresher or orientation courses is a pre-requisite for their recruitment in schools or colleges.

The framework of teacher-education program published in 1988 mentioned the following areas in the objectives of teacher-education –

i) Professional Insight
ii) Professional Competency
iii) Healthy professional Outlook
iv) Professional Development
v) National Interest and purpose.

Concluding Remarks:

Though we have academic individuals, we do not have an academic community committed to academic ideals. What we need are the massive organizations of teacher-educators and administrators at all levels. We do have at present a large number of small organization each led by a small group of enthusiasts; but we do not have a large organization run in a democratic manner by all members of the group of teacher-educators concerned. There are teachers who are highly devoted to teaching and spend much of their spare time for preparation of teaching material and innovative in teaching to sustain interest in the class. They obviously do not have much interest in research and

development which, besides being time consuming deprive them of the intellectual freedom which they enjoy as teachers. The highly qualified and motivated professionals will be attracted to teaching only if the educational institutions provide an environment to enable them to flourish as expert technologists along with teaching. After all, America, England, Japan and other developed countries have been successful in attracting the very best to teaching by giving a high priority to this profession as its quality and commitment directly affects the industrial development and the quality of human resource. In India, the reluctance to join teaching is also because of the value system of our society, which does not acknowledge or recognize the value of those who create wealth which it fully acknowledges the role of the managers and administrators of the wealth of the Nation.

Few Suggestions

1) The subjects and methods of teaching in the Secondary Teachers' Training Colleges, need to be upgraded by incorporating the use of latest educational technology. In most of the schools, a trainee hardly uses OHP, epidiascope, video-cassettes, etc.

2) Teaching profession demands individuals with certain qualities and temperament. Hence, the admission of the students, teachers should be made strictly on the merit basis.

3) With a view to provide wide exposure to teacher trainees demonstration lessons by experts in the field should be arranged.

4) There must be brought about a continuous interaction with the experts in the field by conducting workshops, seminars, etc.

5) Teachers' Training Colleges should encourage GROUP-PROJECTS so as to imbibe in them the spirit of enquiry and team work.

THE TEACHER AS A PROFESSIONAL

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ABSTRACT

This paper analyzes teacher education under the viewpoint of his/her professsionalism. In order to do this, the author studies the reasons the students chose teaching, as well as the method of his/her education, both in the regular activities of teaching/learning, and in practice teaching. In order to become a true professional and a technician, the teacher/educator-to-be needs to know the environment in which he/she will be acting, as well as the persons with whom he/she will exercise his/her teaching/educating activities. The acting of the teacher/educator is an action of citizenship and shared responsibility.

DEVELOPMENT

Nowadays, the bad quality of education is daily talk, including the deficient preparation of teachers. However, it is not sufficient just to talk. There is a need for action. And one of the best ways of acting is to improve teacher education, professionalizing them, making them technicians. There are different ways of professionalizing somebody; through courses, the creation of a professional conscience, through continuing education, through the very practice.

In this sense, without any doubt, practice teaching, as a stage of education, is one of the ways of professionalization. But, how is practice teaching being carried out? It has become formalized, putting the candidate of teaching, easily into a merely experimental situation, without any consideration for the reality in which this professional will work. This comes from the curriculum, which is not always adequate to the real needs of the teacher/educator. Therefore, we are carrying out a research about "The adequacy of the curriculum in teacher education." What the students learns in the courses, does it correspond to what they need in their professional activity? From the answer to this question will depend, in great part, the improvement, or not, of the professional performance of the educator.

On the other hand, one also has to consider the reasons why the students choose the courses of teacher education. Are they essential or secondary reasons? Do they affect the core of the question, or are they only subterfuges, for the lack of better or easier choices?

Departing from these questions, we will try to offer some clues for the improvement of the image, the professionalization and the performance of the educators.

It is convenient to remember that, according to Ortega y Gasset (1962), man/woman is he/she him/herself plus his/her circumstances. Perhaps in the education of the educator, his/her circumstances are not being sufficiently considered. He/She is not perfect, but they need to be educated to become less imperfect. They cannot be educated, simply, as individuals who will exercise a private activity. They will be persons, social professionals, in a given society, or community, with specific knowledge, with very definite characteristics and well situated problems, at least some of them.

As a social being, he/she is both conditioned by his/her social environment, as well as influencing the conditioning of others. It is necessary to educate them in a spirit of liberty, within the personal and social limitations (Schmitz, 1984). He/She may not think of him/herself or act isolated, but he/she has to do it socially. Education is a process which identifies itself with life itself. It never ends. The educator is a person the needs continuously to actualize him/herself. If he/she does not do it, he/she will become incompetent and outdated, as it happens in anyone other profession.

According to Gehlen and Silva (1986:48), education has as basis "the concept of man-world, helping dominated men/women to seek their liberty." The world mentioned is the real world in which persons live, not an imaginary, utopian world, which does not exist. This world needs to be accepted, in order to be transformed.

Demo (1980:14) insists on the "awareness of rights and duties", which characterize democracy, which, as a compromise of all with all and with the whole, represents the participation of all citizens in all initiatives and decisions of the group, for, according to the "Talleres de Educación Democrática", "the cooperative group is a more efficient way, both in terms of learning, terms of investigation and in action." (In Línea 10, 1991:45)

Instead of saying "nobody teaches anybody" (Freire, 1987), we should rather consider that everybody learns from everybody and all learn together, especially

from and with the professional educator. Education, including in it everything which, in any way, helps the person to become a better person, as a process of learning, certainly implies change, at times a radical change in the ways of perceiving, thinking, judging, deciding, being and acting. (Schmitz, 1993)

In order to become a real professional or a technician, the educator needs to develop critical awareness, which, according to Brandão (1985:45), "[...] cannot be donated by somebody illuminated, but neither arises spontaneously. It is through collective fight and labor that both educators and educated create condition for its appearance."

According to Elmore, "most teachers tend to think of knowledge as discrete bits of information about a particular subject and student learning as the acquisition of this information through processes of repetition, memorization, and regular testing of recall."(In: Harvard, v. 61, n. 1, 1996:2). This, unfortunately happens many times with the antiquated, non-professional teacher. They don't remember that teaching/learning is a unique action (sole), which involves both the teacher and the student in the same process of acquisition of knowledge, values and attitudes, in a strict interrelationship between both subjects of learning. Learning requires professionalism.

About the teacher as a professional/technician, says Sacristán: "A teacher is neither a technician nor an improviser, but rather a professional who can utilize his/her knowledge and his/her experience to develop himself in practical pre-existing pedagogical contexts." (In: Nóvoa, 1991:74)

The curriculum, understood as a way of concrete preparation, both of the teachers and the students, needs to create circumstances in which the persons are able to live all the significant experiences of life. In the interrelation between the teachers and the students, the educator keeps acquiring and perfecting his/her professional sense. A product, or a service in any branch of activities is good if it corresponds to the objective kept in mind during it production. The same way, a teacher/educator is good in the measure he/she corresponds to the demands of his/her professional actuation.

According to the Law of Lines and Bases of National Education of Brazil (Law n∞ 5692/71), "primary and secondary education has as a general objective to offer the students the education necessary for the development of their potentialities as an element of self-realization, preparation for labor and preparation for the conscientious exercise of citizenship."(In: Boynard and others, 1972:30)

The recent Law of Directives and Bases of National Education (Law n∞ 9394/96, of December 12, 1996) maintained the same objectives somewhat modified. In article 2, it establishes the following: "Education, the duty of the family and of the State, inspired by the principles of liberty and the ideals of human solidarity, has as aims the full development of the student (educated), his/her preparation for the exercise of citizenship and his/her qualification for labor." In: UNISINOS: 1996:7)

In fact, for the teacher to be able to participate in the reaching of these objectives, proposed by the Laws, he/she needs to be a competent professional. It is very important what the Laws say about the conscientious exercise of citizenship, which, in the words of Demo (1991:17), is "[..] a historical process of popular conquest, through which society acquires, progressively, conditions of becoming a historical, conscientious and organized subject, with the capacity of conceiving and effecting its own project." This development of awareness of citizenship can only develop and be effectuated through the process of education which "[...] Is something different from an end in itself. It is that through which we can gain concrete objectives, directed to determining new routes in the order of social progress." (Romero, In: Línea 8, 1991:48)

These considerations need to be taken into account when we think of the education of a teacher who is somebody who participates, as a partner and a professional/technician, in the process of education of his/her students. The educator does not exist for him/herself, but by and for the community, for the ones to be educated and for the collectivity itself. Democratic education implies the full participation of all the members, a real shared responsibility in the common decisions and initiatives.

The teacher needs to be a professional of teaching and education, which implies a series of knowledges and attitudes, because, according to Della Torre (1983:1), "to teach is an art, and, as such, it is not something to be learned only in books, nor in schools, but practicing, sensing, living."

However, there is the danger of considering teaching-learning only as an art, disregarding that it is also a science, which follows norms, rules and orientations, which require from the one who teaches that he/she be a professional, not an amateur. What we would think if it were only an art. Teaching and education need to be based at least on some scientific principles, or else, they will be transformed into improvisation which is contrary to professionalism.

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It is convenient to remember that the professional/technician is formed a long time. It's a maturing process based on experience. One of the best ways of professionalization is practice teaching, which is not always carried out in an adequate and scientific way. There is a saying that one learns by doing. Which is true, but not by doing things just any way. We really learn if this learning is a real process, it is, with proceedings in which there exist indispensable steps and requirements, which may not be leaped, ignored or disregarded.

In many practice teachings we observed that the practitioners have little decision in the definitions of what they are going to do. There are others who decided for them, and even evaluate them and their work. There is little or no self-evaluation. The professional has to assume all the aspects and all steps of his/her profession and education. The professional is not somebody separate from his/her profession and his/her education. He/She acts and works in community, being at the service of this community, in cooperation with the different members of that community. His/Her service is specialized, but not disintegrated. Unfortunately, as we verified in our researches, generally there is little integration between the teacher and the community.

Bruner, an experienced researcher and educator, makes serious questions, asking: "are we producing thinkers, scientists, poets, legislators, in sufficient number to satisfy the solicitations of our times?"(1975:8) This questioning, without any doubt, refers to the education of professionals in the different branches of human knowledge. But, the same goes for the educator/teacher. Proceeding in a scientific and professional way, the educator will ask him/herself, with Mialaret (1981:107): "A future teacher needs to know from which environment come his/her students, which was the previous cycle, which will or can be the following cycle." In other words, he/she is asking about the process in which is inserted the education of his/her students.

Unfortunately, in education, there still exists much amateurism, conservatism and accommodation. The real professional does not fear to be disestablished, but, rather, he/she tries to direct and advance the changes that occur or can occur. The inadequacy of the curriculum, and the lack of knowledge of the environment for which he/she is being educated is contrary to professionalism. In fact, the real professional teacher/educator is continuously doing research on the reality for which he/she is working, or preparing and the clientele that comes from this environment. In the case of teachers educated at secondary education, this is more necessary, due to the low age of the candidates for the teaching profession.

But, in the research about the reasons for the option for teaching, we verified, in the first place, the professional aspect, because they chose it because "they like to work with children and adolescents", followed by "in order to obtain personal growth", "in order to become an educator", and "to prepare "for a profession". There is a clear tendency in favor of professionalism. (Schmitz, 1997)

In order to become or to be a good professional, the teacher needs to combine and integrate theory and practice of his/her pedagogical work. According to Fávero (1995:65), "Departing from his/her practice, it is his/her [the teacher's] job to construct a theory, which, coinciding and identifying with decisive elements of practice itself, will accelerate the process, making practice more homogeneous and coherent in all its elements." In our investigations we verified that, in general, there is little coherence or integration between theory and practice, being treated successively, instead of being simultaneously integrated. In our research about "Teacher education for the initial series of primary education", we noted that there is little analysis or evaluation of the results and difficulties face in practice teaching. (Schmitz, 1990)

In the education and actuation of the teacher, very easily, one remains in an attitude of consumerism, it is, in what is valid nowadays, being able to be consumed, without a vision of the past, the theory, and the future, the prevision and organization of practice, integrated with the theory, in the present. Therefore, there is a need for a critical vision of reality, analyzing the present and possible elements, in order to conform theory and practice with this reality, without, however, sticking too closely to this present, but with a broad and generous vision of values that are necessary and need to be elaborated and acquired.

In the vision of Sawaya, "only within the taking of awareness there will be able to start to flow, out of each person of a teacher, the revitalizing energy of a process which, transforming the schools into a space of human living and living together, will simultaneously transform the teacher into a creative being, because he/she is a participant of the movement of his/her own regeneration." (1981:75)

There is no doubt that the creativity and the courage to innovate are indispensable qualities of the teacher as a professional. Innovation only happens when one has the courage to experiment, to test, to discuss, to analyze and to draw inferences. The producers of consumer or permanent goods are examples of creativity and innovation. However, innovation and

creativity need to be supported by a solid basis, in order not to degenerate into mere risky and temerarious experimentalism.

Many people think it is sufficient to have the practice of the classroom or of daily life, to improve their performance. This is pure illusion. Practice has to be, necessarily, taken back to the university, or the school of education, in order to be discussed, analyzed and conferred with the theory, in order to make its feedback, so that, departing from their integration, both of them become more qualified.

Theory without practice and practice without theory doesn't work. Naturally, there are many ways of testing and giving feedback, for example: courses, readings, debates, seminars, congresses, meetings, discussion, and many other ways of socialization and deepening. But there may not be a lack of renovation of practice through its communication and analysis. A very serious problem is that a minimum number of primary and secondary schools possess a library, where both teachers and students can refurbish their ideas and seek new knowledge. (Schmitz, 1990, 1997)

One of the more common and productive ways of testing theory in practice and bringing practice back to discussion is practice teaching. Piconez comments on the intertwining of practice with theory: "The approximation of reality made possible by Supervised Practice and the *practice of reflection* about this reality has been given in a solidarity which propagates to the other curricular components of the course, [...]"(1994:25) Unfortunately, as we have found out in different investigations (Schmitz, 1990, 1996, 1997), this practice is still being little used, in the case of supervised practice teaching.

One of the reasons for this is that practice teaching is generally being carried out at the end of the course or teacher education, not giving much opportunity for a deeper analysis of practice and its problems. After analyzing the problems and seeking alternative solutions, we should come back to practice in order to test the new alternatives proposed. It is necessary to establish a real process of feedback of practice and theory. This transition and reversion of theory-practice-theory is necessary to be established, lest happens the juxtaposition of both, as commented by Oliveira:

The subject matters, "on their turn, were juxtaposed, in a sequence of contents of "non-related" activities. which, at the end of the course would result in the education of the future teacher with an immobile knowledge, because to the student there had not been offered a global visualization of the process of teaching."(1994:215)

It is difficult to become an integrated and active professional, whilst the schools, be it the teacher education schools, be it the community schools, live apart from each other, caring very little about what happens at the other one. The professional/teacher does not belong only to the community school, but to the educational systems as a whole, comprising the university, the schools and the community. We verified that there exists very little integration of participation between the forming schools and the schools of practice. They are autonomous, or independent, not offering an ambiance of testing of the theories and the analysis of practice. In order that the education of educators become more harmonious and socially integrated, it is necessary that the schools do not work isolatedly, but organize themselves in a way that they have at least a certain common feeling and a basic organization in order to attend the needs and characteristics of the community in which they actuate or will actuate as professionals of education.

However, the realities of the communities are, at times, very distinct, requiring specific knowledge and analysis adequate to these ambiances. Only being a scholar and a researcher the teacher will be able to attend the typical needs and the characteristics of these situations. Hence the need for a teacher to be a research professional, at least in the most common and simple sense.

We also found out that, many times, the curriculum of teacher education does not correspond to what one expects of the teacher in the community schools, be it primary or secondary school. In fact, the teachers, educators of teachers, should have some, or much experience in primary of secondary education, in order to be able to prepare their students with greater knowledge of this reality. (Schmitz, 1997)

About the professionalism of the teacher which is indispensable, we have the incisive manifestation of Fávero, who affirms: "It is not only frequenting an undergraduate course that a person becomes a professional. It is, especially, compromising him/herself deeply as a constructor of a praxis that a professional is being educated."(1995:65) This is what we verified in our investigations, although not always practice or praxis is being considered as an indispensable element for the education of a good professional. Many times, it is superficial, without the due analysis and discussion, in the sense of uniting theory with practice. This goes for teacher education, both at university and at secondary schools.

Practice includes not only the subject matters taught or developed, but it refers to the whole of the lives of the teachers and the students. Differing from

other professions, in education there are included elements of family, community, social, political, cultural and ethical life. The situation of teaching-learning includes all the values with which lives and lives together the teacher and his/her students, in an existential reality.

The teacher, as a professional, is responsible for the creation of an ambiance favorable to learning and education, because, according to Schmitz, "one of the main jobs is to help create a climate of collaboration, integration and shared responsibility. He/She has also as a job to select and organize experiences in which the children or the adolescents will be able to learn better and more deeply."(1993:37) The creation of an ambiance depends in great part, on the teacher and his/her personality. He/She may be an excellent knower of the subject matter and the methods, but the results will be deficient or poor, due to his/her inability in human relations and sharing of experiences.

It is part of the professionalism of the teacher to know in profundity the environment from which come his/her students. There exist many circumstances intervening in the actuation of the educator, so that he/she needs to be always alert to the minimum manifestations of his/her students, in order to capture their expectations, hopes, problems, frustrations and values. Only with the development of a deep critical sense, a refined creativity, the teacher will be able to become a competent and successful professional.

Perhaps one of the most serious problems to be faced with courage and decision is the didactic-pedagogical formation. We do not speak only of the lectures of didactics and methodology. We mention a much broader actuation, required by our times: the mastery of the media, or communication. Nowadays, hardly, a teacher will be actualized and proceed in an adequate way, if he/she does not master information technology. IT represents an infinity of resources able to improve his/her actuation. The teacher needs to produce and reproduce texts, both of his/her own, as well as of his/her students. The school itself should put at the disposal of the teacher sufficient technological sets so that they become able do produce, even if it were only a little wall newspaper.

The mastery of electronic technology refers also to the use of multimedia: datashow, projectors, videos, transparencies, radio, television, Internet, Intranet, and many other utilities which informatics or electronics offer the professionals. The Brazilian government is offering to the schools some electronic machines, which represents only the beginning of a new era,

although it is already more common in more developed countries. But it is a good perspective for the professional educators.

But there will be little profit in putting at the disposal of the teachers modern media, if they do not learn how to use them or even resist to using them. It is the job of the universities and teacher training colleges to prepare the future teachers/educators the use of the more modern media of communication: radio, television, computer, multimedia, Internet, Intranet, Comut, and many other instruments useful for the improvement of the educators.

UNISINOS is making a very important and innovative experience in teacher education, putting at the disposal both of professors and students different laboratories of informatics, with free and direct access to Internet and the internal net. Furthermore, both students and teachers are being trained for the use of these instruments. Besides this, each professor of graduate courses has his/her own computer, connected with Internet and Intranet.

But, there is no use putting at the disposal of all these resources, if they are not prepared for their use. Therefore, they must be trained in their use. Any teacher, in order to become a competent professional, needs to use the modern media of communication, lest he will continue to be only a user of xerox copies, and blackboard, which, by the way, is not terrible, as long as it is not exclusive. Any other professional is always actualizing in the use of the most modern instruments of his/her profession. Why shouldn't teachers do the same?

Professionalism of the teacher requires of him/her that he/she posses the most modern media for the exercise of his/her job. Accommodation and resistance to innovation are not good policies in the profession of a teacher. We are dealing with persons, young and adolescents, who, in great part, master, or, at least, utilize modern media. How could the teacher, possibly, work with and for them, if he/she knows less than they do? What motivation will the youngsters have if they see their educators immobile in time and space?

However, it is not a matter of a mere modernism, but it is a need of adequacy to modern times, in order to be able to attend his/her job of an updated educator. We do not need to fear the domination of technology, if, instead of fleeing it, out of fear of being dominated by it, we anticipate it, submitting it to our mastery and utilizing it in the measure it is useful and advantageous for us.

In order to confirm the need for professionalism in teacher education and actuation, we will briefly refer the results of some researches carried out by ourselves, about teacher education.

To start with, we carried out the analysis of practice teaching, which all, both teachers and students, considered indispensable, because it integrates theory and practice. But, at the same time, one verifies a considerable number of drop-outs from the courses of teacher education, especially for the lack of motivation and incentives and, evidently, the bad remuneration, which makes professionalism difficult. (Schmitz, 1997) On the other hand, in the same research there appears the reason why they chose this course because "they believe that teaching is of future." These manifestations give rise to the hope that professionalism of future teachers will improve.

As to the real reasons why they chose teaching, there appears: "to become an educator" and "to help in the construction of a better society". The professional objectives go together with the social ones. As to the characteristics of a good teacher, they are: "responsible", "interested", "active", "creative". As to the worst limitations of a teacher there are considered: "irresponsible", "centralizing", "careless", "accommodated".

As to the possibility of integration between theory and practice, there appears the problem of the duration and the period of practice teaching. Many times it is carried out only at the end of the preparation course, whereas the indicated durations would be that it initiated at least at the middle of it. Another problem detected is in reference to the place of practice. It should be at community schools, but also in this respect there is a variety of opinions, going from a school of the university itself, to schools of the community. We detected a lack of integration between the training schools and the practice schools, making difficult the integration between theory and practice.

Another serious problem happens in the case of the elaboration of the programs, in which the students participate very little. We try to educate professionals without their participation. On the other hand, practice teaching is being considered valid, because it offers the realization of new experiences, the practitioners contributing to innovation. If these experiences are later analyzed, it will be an excellent opportunity of learning.

As for the reasons for the choice of teaching, the students offer different reasons, the main ones being: personal liking, liking of teaching, modification of the environment. The teachers added the objective of educating critical citizens. As to the accompaniment of the students during their practice, there is little participation of the supervisors, besides the reports of the students and the debates at the university, as well as seminars. There should be much more follow-up, it is, taking advantage of the experience of practice, for more

profound analyses of the whole experience, integrating practice with theory and vice-versa.

The practical experience is being considered as a link between theory and practice and a preparation for reality. The idea of preparation needs to be analyzed in greater depth, because practice needs to be carried out in reality itself, without any artifice, departing from reality and coming back to it. Very easily it happens that practice is programd with great care and even with artifices, which does not happen later in the teachers' professional activity. In order for somebody to be and act as a true professional, every activity needs, always, to be programd and evaluated with seriousness.

Another problem for the professionalization of the future educator is that he/she participates little in the decisions about the curricula and programs he/she will carry out in order to prepare for being a professional. In order to promote integration between theory and practice there would be indispensable integration between those who organize and those who carry out this activity. Without the continuous, and responsibility sharing participation, it will be difficult to educate a competent, compromising and actuating profession. (Schmitz, 1990, 1996, 1997)

At the moment when the educator/teacher convinces him/herself that it is necessary for him/her to be a competent and responsible professional, he/she will also require, in his/her education that he/she take greater part in the decisions taken about his/her education and actuation, because it is he/she who will have to assume the responsibility for his/her actuation and performance. If he/she does not assume from early times, they will, later on, become accommodated, lazy and fearful of taking their own initiatives, depending on the orders or permission of somebody else.

As a professional, he/she will also fully respond all of his/her decisions, assuming with assuredness his/her tasks. On the other hand, he/she will have to take awareness that the same liberty he/she requires for him/herself, he/she will also have to permit and promote for his/her students. This refers both to the teachers educating other teachers and to the teachers themselves in their actuation at community schools.

CONCLUSION

Departing from the results of our investigations, we propose that, in teacher education, one attend much more to their values and expectations, in order to adequate the curriculum and all the activities to their reality for which they are preparing themselves. There is also a need for organizing education as a process, with different ingredients: theory, with practice, contents, methods, proceedings, acquisition of the instruments indispensable to their actuation, the knowledge of reality, both of the community, and their students, the continuous critical revision of everything they learn and carry out, an enterprising and creative spirit, in order never to accommodate to what they are knowing and doing today. It is necessary that they develop the democratic spirit of responsible participation of everybody in everything being carried out, the social living, never isolating themselves from the others. Finally, it is necessary that the educator educate him/herself as a comprimised and dynamic professional, from whose professional actuation will depend, in great part, the learning and education of his/her students.

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FROM THE VIEW-POINT OF INFORMATION TECHNOLOGY DEVELOPMENT TO DISCUSS THE PLANNING OF A TEACHER'S CAREER-LEARNING

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ABSTRACT

This paper infers by induction the social features in high development of information technology, which are: (1) information quickly generates to result in a knowledge explosion; (2) information rapidly changes to lead to a short life of knowledge; (3) information transfers easily to store and retrieve which results in an expedient learning of knowledge. Therefore, the student gains knowledge not only from the teacher. The teacher's role will not equal to knowledge giver. The role of a teacher may be seen in three ways: (1) a guidance role that teaches students how to learn; (2) an information-coordination role that helps students to learn through program-design and activity-guidance; (3) a meta-reflection role that teaches students to accept different kinds of knowledge, and teaches the ethical issue of information. The conclusion is that the instructional activity of a teacher will be 'a pluralism', 'a profession', and 'open to the public'. The professional career of a teacher is to learn: (1) how to retrieve and use information; (2) to generate information; (3) to be a self-directed learner; (4) to be a lifelong learner.

keywords: Information technology, a teacher's role, career-learning

Foreword

Surveying from a view-point of organization theory, school is an organization which possesses ecological layers. It grows and develops by the environmental evolution (Shieh,1985). Also from the view-points of system theory, school is a sub-system within the social system. In an open society, school should evolve with the outer environment, and thet shall also agitate, influenced by each other. While the school education is assaulted by the outer environment, whether it is a political, economical, cultural or technical assault, as a sub-system of school education, teacher group should also adjust its way of doing, to adapt the environment, also attaining the goal of growing and developing. Teachers, as key members to attain its organization goai in the school system, under the high development rate of information technology, should realize the outer situation change clearly. While under this mutual-motioned situation, they need to deeply reflect the behavior module that should be expressed by a teacher, which is from the point of view of social members. Through this role cognition, the teacher can draw a clear project for his own lifelong learning , and meet future challenges. This is the motivation and the goal of this paper. In order to get to this goal, this paper first analyses the social features in high development of information technology, then to reconsiders the teacher's role and position. In the final analysis and summarization the author proposes the substantial direction of lifelong learning for the teacher to plan .

Social change in trend under high development rate of information technology

In the master-piece of "Future Shock" A. Toffer(1970) described that there should be three aspects for future human development: (1) novelty: there should be an age where information develops swiftly, which surpasses the limitations of time and space; (2) temporary: the old theory & idea shall be replaced by the new ones, also the replacement period should be much shorter; (3) variety: the social value and ways of living shall be diversified day after day, so we need the abilities of self-judgement and decision-making.

Surveying from the tendency of civilization developing of human technology, the enterprise pattern of the third-wave is guided just by service field, such P. F. Drucker (1993)named it as "post-capitalist society", the same as "post-modern society" by I. Hassan(1987) and F. Byotard(1984). The features of this third-wave technical civilization are features on "Information is Power; because the knowledge shall mainly guide the civilizations development. It may also be called "knowledge society" or "information society".

By the high-speed development of information technology, and the convenience of a communication network between peoples, every information system, such as: disperse data-base, electrical-communication network, interactive video-disk etc, shall cause great impact to conventional learning in school. Generally we apply "information society", "push-button society", "the third-wave", or "post-industrial society" to mean this future society. Though they have different names, all indicating the same characters, that is: situations of the future society should be of swift-change and information floods everywhere, the features of the future society can be summarized as follows:

The information quickly generates to result in a knowledge explosion.

Around this world, with never-ending changes and improvements, science and technology advanced tremendously, and information emerged swiftly. For a person born in 1940, till 1990, the following occurred in Ornstein & Hunkins (1993).

1. Telecommunications became popular.
2. The speed of information processing increased a millionfold.
3. The rate of population increase went up more than a millionfold.
4. Space missiles, space satellites became commonplace.
5. Human organs were transplanted
6. Moon And Martian landing were success-fully completed
7. Genetic engineering, test-tube babies, and sex selection became realities
8. With a portable remote system a TV viewer can instantly tune into one or more of 100 channels and connect to any part of the world.
9. More than 75% of the items on supermarket shelves today did not exist in 1940.
10. Computers are common in everyday life.
11. Whereas three-fourths of Americans employed by industry in 1940 were manufacturing goods, today more than 75% are providing services.

Also by looking at the statistics (Sung,1989), since 1979, books published annually around the world about 560,000 copies, and magazines around 60,000 categories, professional reports around 300,000 categories, and technical reports around 5,000,000 copies. Speaking about publishing items, currently the annually published science report number around 5,000,000 copies all around the world, which means 13,000 copies daily. Published items last century would only account for seven months current publishing capacity. The total sum of information of all the world may be doubled in only

7 years, and also the knowledge of most experts shall be out of date after only 5 years, because they are replaced by much more newly-emerging knowledge (Apps,1988). Thus for a professional expert, they must always cost 20% of their working hours, to study for the newly-developing knowledge of their own field, so that they will never be out of date (Cross,1981).

Living in an information society means the information produced is very fast. And information is flooding among society every-where. It is a great challenge to modern people. Everybody can't absorb modern information day by day, they'll never successfully develop in this modern society.

The information rapidly changes to lead to a short life of knowledge.

The information in an information society not only generates quickly but also changes quickly, and much more than ever before. To measure the rate of change, we can divide the last 100,000 years of human beings into1333 lifetimes, of approximately 75 years in each span. Only in the last six lifetimes has mankind used the printed-word. Only in the last two lifetimes have we used the motor. Only in the last one lifetime have we used electricity (Ornstein & Hunkins, 1993). One can see therefore speed will be a important feature in future society.

Currently those electrical, communication and information products also change society and influence our daily lives, including jobs, knowledge, value & moral images which all adjust and change continuously. By the estimation of Charner & Rolziski(1987), by the year 2,000, around 15 million to 20 million jobs will have disappeared. But also by the production of new technology, there shall be around new jobs, and the relating service positions to maintain these new technical products shall be around 4-5 million. Except for the disappearance and creation of jobs, self-run enterprises shall also emerge, especially those technicians who are mastering the technology of computer, video-disk & laser.

Hwang, F. S.(1995) indicates that we use the idea of "half-decline period" in academic circles to measure the out of date phenomena of expertise. The "half-decline period" of expertise is the time that the professional only rest after one completes one's discipline. For example, the medicine circles have a fast "half-decline period" of about only five years, and the psychology circles about ten to twelve years. An advanced psychologist need read thirty to forty papers daily, if one wants to keep with the newest trend. Also by the survey of Fay,

McCune & Begin(1987),by the year 2,000, there shall be persons around 80 % engaging the field relating to information in America, that also means the information field shall overwhelm all the employment structure. In the future more people shall be engaging in the jobs of producing, arranging, analyzing, and distributing information.

The information quickly and easily transfers to store and retrieve resulting in an expedient learning of knowledge.

By the swift development of transportation & communication technology, this also shortens the distance between country and country, from which emerges the image of "Global Village". When an event happens anywhere around the world, it all can be quickly transmitted by way of communication satellite and Internet, and made known to everybody. So that everybody can be at school, at home or at any information, applying the Internet to discuss messages or collect information with anyone around the world. This also realizes an old Chinese saying:" Further afar like neighbors"

As for talking about the "storage" of information, by the high-development of Laser technology & IC crystal-slice, the memory capacity of the computer is enlarged by and by, currently the storage of information, it is not only simple and quick, but also the loading space is smaller. Applying laser technology can help store a huge quantity of information in only a small CD ROM.

Such is the evolution from industrial society to information society, it causes great changing to the social structure. In industrial society, machinery technology enlarged physical energy, and material wealth is the main value. In an information society, computer technology enlarges our intellectuals, so knowledge and information are the real capital. So a teacher ,under this high-developing society of information technology, should absorb new information at any time. The teacher also needs to improve and advance new knowledge, to not be let behind in the future.

The redefinition of a teacher's role in the changing society

One of the main functions of education is to teach people to adapt to the need of the society. The student that has been taught in modern society will be living in the future too. So, the role of a teacher in the future society that is full of information, does change gradually from a static, one-direction, negative, and passive cognition to dynamic, two-direction, positive, and active cognition. In the traditional idea, the main duty of a teacher is to teach, to let student assimilate and keep subject information that a teacher presents. Therefore,

what a teacher is concerned with is how to arrange teaching-material and teaching-method. In this circumstance, it is possible for us to take the learning process of a student to be like a sponge that sucks passively and wholly the knowledge that the teacher teaches. But when the educational level in the whole society is commonly high, and when the way of communication is very open and expedient, the places where a student learns will not only be constrained in school. The students need not acquire knowledge only from the teachers. The role of a teacher is different from the past. That is to say, a teacher's future role is not equal to give knowledge, and what a teacher teaches is not limited to the material of knowledge. In the future, a teacher may act the role as follows:

A guidance role

The future teacher may play as a guidance role that teaches students how to learn by themselves and that teaches students how to create their learning model, and helps students to get information, to differentiate information, to organize information in the society of knowledge explosion. Because the information is expediently required in the information society, and the learning activity occurs everywhere, so the learning activity is the responsibility of the students themselves. The duty of a teacher is to help students to understand themselves, so as to initiate and to reinforce the students' learning motivation. In other words, the duty of a teacher is to help students' self-directed learning , so as to transfer the subject knowledge that is learned from the teacher into a meaningful knowledge structure by the students themselves. The instruction activity need transfer from a one-way presentation to two-way coordination, so the role of a teacher is sometimes like a consultant.

An information-coordination role

The future teacher may act as an information-coordinator that helps students to learn through program-design and activity-guidance. Socrates'(470 BC~399 BC) mother is a midwife, so, he frequently takes his role as a midwife to help people to bear their wisdom that belongs to themselves. Socrates had made a paradigm of a teacher's role in the information society(Shiu,1996). Owing to the high rate of development of information technology, it pushes the student to the center of the classroom. The game, experiment, and cooperative learning style that the student is the center of the classroom, will gradually become a main stream of the learning activities. The teacher may design some learning-program for students to discipline their mental ability of comparison, judgment and imagination. The students' cooperative ability, problem-solving ability is

disciplined by using team-work's simulation program, so as to improve their learning outcome. In such circumstances, the teacher needs to act as a classroom manager who creates a nice environment for learning. The teachers need to use their creation to design a curriculum, and need to use new technology to design pedagogy, so as to activate the students' learning-motivation. The learning-style in a society which is full of information may not follow step-by-step but depend on what the student need, so the instruction activity needs to be developed and coordinated according to the student's interests. In other words when the society is in whole democracy and full of information, the teachers can't act as "a man who monopolizes the knowledge" or "a man who only presents" to construct his instruction's authorization, but act as an information-coordination's role, through program-design and activity-guidance to help students learning.

A meta-reflection role

The future teacher may play a meta-reflection role that teaches students to assess what kinds of knowledge are acceptable, and teaches the ethical issue of information. Following of information technology development, the Internet is more and more popular, the crime problem the Internet is more and more serious and complicated too. For instance, the crime style in Taiwan has two patterns, one is to do illegal activity by using Internet communication the other is directly to destroy the net. The kinds of crime behaviors are: (1) sex crime, (2) economic and finance crime, (3) infringe upon copyright, (4) to make threats, (5) to slander, (6) to deceive, (7) to sell illegal goods, (8) to steal or break commercial secrets (Central Daily News,1997). The most fearful behavior in the above is the security problem of the data-base that has been depended upon in the information society. The computer network has been able to be used as a crime instrument because of its anonymous and dispersed framework. Under the management style of "the circumstance of none-government", the user can construct his network station as he wants. So when we appreciate the convenience that the network brings to us, the teacher should teach students to distinguish what kinds of information activity are acceptable, and to teach students the ethical problem when doing information activity. This active role the teacher needs to play in a complex, changeable society, rich of variety.

Because the information generates and changes quickly, the teacher should help the students to search for newer information and resources. Those finally transfer into students' knowledge through their self-construction, by the teacher's

guidance. There will be more and more new media to be applied in the classroom in the future, so the teachers need to learn how to apply modern technology in instruction and assessment. Also, the teacher needs to create a nice environment for students to learn. Those environments can be fulfilled by using program-design such as game-play, experiment, or cooperative-learning. We hope to direct the students to recognize their social obligation, that is to let the students bear good qualities in the future. The traditional teacher-centered pedagogy let the students learn passively and lack of autonomy. In the society in which the information technology develops quickly, the teacher should let the students posses more autonomy and responsibility in the learning activity. When the learning style transfers to student-centered, we can cultivate student to have an important problem-solving ability, which makes the learning level deeper. Therefore the learning progression is not limited in memory or understanding level but expands to analysis or evaluation level. In the student-centered activity learning place is not limited to the classroom but can expand to everywhere (Liou,1994). Because of those roles' transformation, the instructional activity of a teacher is to go towards 'a pluralism', 'a profession', and 'open to public'.

The planning of a teacher's career-learning

Owing to the development of information technology, the applications of computer technology will mean never-ending changes and improvements in the future. Many new technological goods are found in the market. The application of such goods as CD-ROM, Videodisc, Network, and Multimedia will enter school generally and be used in instruction. Recently, elementary and junior high schools in Taiwan have acquired computer equipment, elementary schools in the U.S. have applied computer to teach basic subjects too. The function of technology in school education can be inferred by induction in five parts: (1) the application of technology can make instruction match learning-psychology; (2) the application of technology can offer new teaching material, therefore to expand the learning field; (3) the application of technology can help the teacher to do the instructional activities of learning-checking, recording, and guidance; (4) the application of technology can enhance the learning opportunity, owing to the gap between city and country, especially in teachers' quality and government finance, therefore to make the learning opportunity more equal; (5) the application of technology can improve learning performance. The application of technology in instruction has patterns such as: (1) personalize-guidance teaching, such as the application of the software of CAI, instructional television of distance-learning with one-way transmission,

educational videodiscs, video tapes; (2) exploratory learning, such as electronic database, microcomputer-based laboratory of simulation, multimedia system; (3) auxiliary learning instruments, such as information processing system; (4) communication, such as the application of network.(Perng ,1995)

When new technology is applied in instruction, the teacher uses different pedagogy in the classroom. Therefore, teaching styles will be different from the traditional way. The application of new technology not only changes instructional style, but also lets the teacher get more resources conveniently, which the teacher searches to let the students learn more effectively. In order to match the features that information generates and changes quickly and easily to store and retrieve, the professional career of a teacher needs to learn:(1) how to retrieve and use information; (2) to generate information; (3) to be a self-directed learner; (4) to be a lifelong learner.

The professional career of a teacher is to learn how to retrieve and use information.

In the face of so much information, the important thing for a teacher is not to know how much information, but to learn know how to get and apply information. In memorizing information, the memory ability of the human race is unable to keep up with that of a computer. Therefore, in the times of knowledge explosion, the key ability is how to collect, analyze, refine, judge, reorganize, and apply information.

The professional career of a teacher is to learn to generate information.

Society changes quickly and the behavior of the young people is changeable too. So, it produces the phenomena M. Mead described, the postfigurative culture, the cofigurative, and the prefigurative culture. Those different cultures affect each other and shake the teacher's instruction. In the future, information technology will enter into school ultimately. When information is fully open in the fully democratic society, the teacher needs to use a scientific way of presentation to express his knowledge of curriculum, teaching-material, pedagogy, and guidance etc.. When using those methods to communicate with students' parents and others ,the teacher can be more trustworthy. Therefore, the ability to generate knowledge in the field of curriculum, teaching-material, pedagogy, and guidance, will help the teacher to posses specialized authorization. This specialized authorization can't be protected by other systems. It depends on the teacher's demonstration.

The professional career of a teacher is to learn to be a self-directed learner.

Self-directed learning has been used to describe a form of learning style in which people act on their own initiative, with or without others' help, to plan, conduct, and evaluate their own learning activities (Knowles,1975). A. Tough (1975, p.7) used learning projects to make an operational definition "as a series of related episodes, adding up to at least seven hours. In each episode, more than half of the person's total motivation is to gain and retain certain fairly clear knowledge and skill, or to produce some other lasting change in himself." There are many concepts about self-directed learning, such as self-learning of a person in the group, a further learning when a person graduates from school, a person by himself chooses teaching-material and resources to learn, a person by himself chooses learning-network or learning-contract or self-help book to learn, a person attains some professional group or project to learn(Tough,1989).

So, self-directed learning is a learning style where the learner purchases and controls his learning opportunity independently. The learner initiates by himself to judge his own need, to form his own goal. It is the learning process through which one purchases ones learning resource, chooses ones learning strategy, evaluates ones learning outcome. The teacher as a self-directed learner can not only acquire subject knowledge but understand more about his habits, feelings, expectation, value, and potential power. A self-directed learner will more deeply understand himself so as to believe that one can control more living and fate.

To be a self-directed learner, the teacher needs to learn the ability and method which includes how to judge what one needs, to set one's learning goal, to search one's learning resource, to have one's learning activity, to evaluate one's learning outcome. The ability of self-directed learning is an ability that the teacher should have in one's professional career.

The professional career of a teacher is to learn to be a lifelong learner.

Lifelong learning is a process whereby one acquires knowledge and skill, which is to maintain and improve one's vocational or professional ability, and to improve personal development (sell,1978). The U.S. government proposed the Lifelong Learning Project, which is considered as a process where a person continues to develop one's knowledge, skill, and attitude in all the life(U S.

Government Printing Office,1978). Hassn (1996) considers the main goal of lifelong learning is to: (1) help personal development; (2) enforce democratic personality; (3) expand the living of community; (4) improve social blending; (5) enhance productivity by innovation, so as to improve economic growth. In the final analysis we know lifelong learning is a necessary process for a teacher to adapt to the society of knowledge explosion. Lifelong learning can enhance a teacher's ability of adaptation and living quality, and make the teacher innovate continuously. Because of the high development of information technology, the teacher can learn anywhere and at any time, it supplies the expedient environment for lifelong learning.

Lifelong learning is the most important thing in the four kinds of learning planning as mentioned. If there is no lifelong learning, a teacher's expertise will out of date soon. The teacher may use self-reflection to know the limitation of one's life, and the impotence of instruction, so as to develop self-actualization of educational love. Let it to be a driving-force to fulfill lifelong learning.

Conclusion

The teacher opens the students minds with knowledge. He/She has the most important role in the teaching process, to affect student behavior. It is unavoidable that the teacher's career will face serious change in the environment in the future. When faced with the future, the teacher needs to understand the phenomena of the change, and be glad to accept this change. Time and space will change quickly in the 21st century, the teacher needs to recognize his role actively, and through this role's cognition, the teacher should draw a clear direction for his own lifelong learning. The directions are to learn how to retrieve and use information, to generate information, to be a self-directed learner, and to be a lifelong learner. Following those directions, the teacher can match the necessity of the changing society in the future.

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Promoting Professional Qualities for Cameroon Teachers and Teacher Educators

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Promoting Professional Qualities

ABSTRACT

The professional qualities of Cameroonian teachers and teacher educators are measured by examination results. Concern about their competencies arises from increasing social change, new knowledge, much information and advances in technology. These new elements seemingly require new pedagogic skills, teachers with high level of cognitive, interpersonal and motivational abilities. Such abilities are constitutive of a capacity for situational analysis and understanding in the development of reflective minds. A chain of events exist in this context. If teacher educators use appropriate pedagogic skills and are able to be self evaluative and reflective in decision making, student teachers would do same, consequently pupils.

Researchers and innovators have attempted to identify and address factors (personal, organisational and social) that influence professional abilities. Because these are not yielding the type of impact expected, there is need to explore opportunities from new information and communicative technology to foster career-long learning. More collaborative effort through network at all levels has to be encouraged, if teacher and teacher educators must become reflective thinkers, a desired professional quality for the 21st century. Teachers and teacher educators have to shape the academic and practical culture within the Cameroonian society.

Introduction

The professional characteristics of the Cameroonian teacher are greatly influenced by the orientation of two colonial cultures (English and French). By this orientation we are more connected with the outside world, than with the realities of our own situation that are rich in themselves. The colonial culture as obtained in education is inadequate. It cannot satisfy the needs of a people who are flexible, creative, interactive dependable, collaborative and co-operative. In a way it is evident that they practice democratic process in their everyday endeavours than can be imagined by outsiders.

As the colonial objectives in education were limited in scope and depth these reflected in teacher education and practices. The same rituals are performed which do not promote scholarship. This situation becomes more complex because of an administrative machinery which is basically

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centralised. To promote professional qualities for an interconnected world, a teaching professionalization scheme must be reflected upon for Cameroon. This scheme of course, must be founded on the history of the country and education policies. The requirement of interconnectedness in a progressively changing society demands a high degree of sharing of experiences, partnership and collaboration.

The call for the promotion of quality teacher education for an interconnected world at the eve of the third millennium is an important step for teacher educators to examine opportunities available for professional learning and development in the profession. We rely on pre-service and in-service training for professional growth. Yet there is much to be learnt even outside the structured in-service programs. We learn by sharing, participating and obtaining information, from other individuals and communities Diamond (1991) points out that education is an effect of self in community. Sharing professional experiences through networking is valuable in this regard, particularly with access to communication technology. In which case, teacher educators ought to make it their duty to be better placed to obtain valuable information which they can disseminate to teachers. A chain of network created should link teachers and teacher educators at various levels.

Teacher educators are models for what ought to be appropriate professional qualities. These qualities or characteristics or attitudes are determined by factors that are personal, organisational and social. With increasing advances in communication technology and information these are bound to affect what ought to be the constituents of professional characteristics. The availability of these resources is not a panacea for learning and development. The attitude to want to engage in career-long learning activities is a critical issue. An important aspect for interconnectedness is interest. Interest motivates an individual in such a context to want to keep abreast with new trends. The personal qualities of teachers and teacher educators must be addressed in order that they become more competent and positive in their attitude towards professional growth. The organisational structure should promote rich learning opportunities. In this way, good social climate for work will foster positive professional attitudes.

Education is an enterprise whose commodities and their market values are continuously changing with social change. Since the task of schooling is becoming more specialised, there are many new areas of knowledge. In this regard educators are taking on a differentiated array of responsibilities. The

success of what they do as professionals is as much a major part of this responsibility. This new ecology of education seems to be making great demands on professional qualities. Some of these are being reflective, intelligent, resourceful creative, patience, good interpersonal relationship, being responsible, and committed.

Teachers at all levels have the primary responsibility to mould minds. These teachers are not reflective and sometimes they function at a low cognitive level by engaging more in routines which create barriers to enable the mind grapple with problems. The human mind is infinitely capacious. The teacher with a higher cogniiive level understands better the rudiments of the subject matter. Understanding the subject at a higher level permits a better awareness of what constitute sound pedagogy. In this case we can begin to compare notes with others on what should influence how teachers act on knowledge. Sharing these experiences is vital for career-long learning. Such sharing can be through the use of new technology, face to face interaction and print as we have access to other scholars through connections.

This paper examines some research and innovation in Cameroon to examine how these have influence career-long learning and development. Further it discusses the impact and opportunities of information and communication technology.

Some Background Information

The question of quality as a whole led the Cameroon government to overhaul its university and school system. In 1993 six new universities were created. The essence was to reduce the congestion of the one main university and ensure quality. Three years afterwards there is an ongoing evaluation exercise. What is clear is that for some faculties, the teaching load and the class sizes have been greatly reduced. Some lecturers have more time for research even though the available support is very marginal. Lecturers have better access to students and more opportunity to enhance their professional growth.

Ro linked improved university image with the school system, the democratisation of the education continues with the opening of schools at all levels. The effort to link the pedagogy of the school system to university expectations is ensured. More teachers are also being trained. Even with these, much is yet to be done. In 1995, the education forum addressed the quality of education. At the centre of the problems is teacher edu-ation and teachers.

Weakness in teacher factor was based on situational factor, models for training, poor working, conditions, low morale and salary, absence of social status and above all the absence of opportunities and structure for career growth profile.

The organisational structures which manages teachers and their affairs were questioned. Without doubt, bureaucratisation can have profound effect on the functioning of educators. It hinders initiative, autonomy, originality, creativity and even democratic functioning. These professionals require nurturing within viable administrative structure, support system and network to ensure linkage within the country and the outside world. In this way we can be sure of better collaboration for professional growth.

Promoting professional qualities though slow, has been initiated. The next section of the paper will report some basic research findings on attempts to identify some valuable characteristics for the profession.

Review of Some Studies

Professional qualities provide indicators for judging the basis for accountability by individuals or groups of practitioners in a profession. Moreover, the quality of the school performance at all levels of the education system is more likely enhanced by training programs, which foster the development of these qualities. To obtain any good results teachers educators themselves must possess these professional qualities. Both affective, cognitive including leadership qualities are valuable components to function in any interconnected world.

The studies of Ryan (1961), and Rosenshine (1971) identified a number of what we can call professional qualities. Perrot (1984) exemplifying these in classrooms found them to be good indicators for an effective teacher. Some studies in Cameroon found support in the above and other studies reported by Dunkin and Biddle (1974). Ndongko and Amin (1988) investigated students' evaluation of their lecturers. The findings showed students arguing that lecturers who were enthusiastic and empathetic had sound knowledge of the subject matter. Furthermore, to identify desirable professional qualities among teacher educators, Tchombe (1989) conducted a survey among student teachers of primary and secondary levels of teacher education including teacher trainers. The findings showed that the affective and social components were more valued than cognitive. They argued that with a balanced affective and social components, cognitive components will be attained. This is the case because teachers and teacher educators will work better and grow professionally if their working conditions are balanced.

Successful teaching learning depends on the teachers' ability to negotiate through class interaction. Ewonkem (1995) found that to be a good teacher, one should discriminate between dominative and integrative interactive styles. As a follow up of the Education Forum in Cameroon, three World Bank sponsored projects were carried out at the primary (Yembe 1997), secondary general (Tsafak 1997) and teacher education (Tambo Leke and Tchombe 1997) levels. The findings of these studies amply demonstrated the role of the teacher in performance and the pertinence of the teacher training models used. Reviewing issued related to teachers and their training immediately points at the critical role of teacher educators. So we begin to see that teacher educators are the central point and their performance should be examined critically.

Some recommendations to help promote appropriate professional qualities were made. The general trend in the educative process is that teaching should lead to learning. Since the teacher is the critical variable it behoves all concerned to promote their professional qualities.

Teachers therefore, must assume a leadership role in classroom activities to ensure efficient learning outcomes. Yet we must not mistake leadership as an organisational function and leadership as a personal quality. We observed significant relationship between leadership qualities in classroom organisation and management and achievement (Achidi 1997, Gana 1997). Variations in developmental processes and the various tasks the teacher must engage in, necessitate the teacher to be in charge. Mental adjustment can be enhanced or hindered by poor leadership in classroom which may lead to truancy and disruptive behaviour.

From the foregoing, teacher education programs rely more on findings from research that are specific to Cameroon to identify some professional qualities. These efforts are increasing today but earlier efforts had led to some innovations and strategies adopted to promote the necessary professional qualities.

Innovative Programs and Practices

The great desire for relevance, efficiency and equity was equally matched against a search for the constituents of professional characteristics in Cameroon teachers. This led to number of innovative programs in curriculum and teacher training including reforms and new ways of doing things.

The 1970s saw the desire in Cameroon to ruralise education. With this move, the need to train teachers with specific professional qualities was

envisaged. On account of this, teacher education programs were redefined, the duration, content and techniques for training were re-examined. More accent was placed on certain curriculum materials like agriculture, arts and crafts. New practices adopted the integration approach where agriculture provided the framework for teaching sciences, mathematics, language and so on.

Other practitioners in the field around the world came in, with new ideas and skills. Already this collaborative effort was a pointer to the interconnected concept. In some cases, the mother tongue was introduced. Teachers had to be prepared by a teacher who themselves understood the vision of education for Cameroon. Different training programs were designed.

Bilingualism in Cameroon led to the innovation of a special bilingual programs for the school system. To attain this goal, bilingual teachers were needed. Among the professional qualities required, proficiency in the use of the English Language and the French Language was an imperative. Training programs were designed. Language laboratories created in the Advanced Teacher Training Colleges. Teacher educators with bilingual qualification were in demand. These were trained in Cameroon and abroad.

Based on these programs and the nature of professional skills needed, student teachers for this speciality spent one year of their training in either England or France as the need arises. These two innovations had, as part of their objectives, the promotion of professional qualities specific to the disciplines and the philosophy of the programs. The resulting effects were that a new group of teachers emerge. These were more scientific in their approach and there was some evidence of reflectiveness and creativity in their practices.

Newly introduced innovations within the existing school curriculum addressed the training of teachers in environmental education, culture, guidance and counselling. Computer literacy is encouraged among teachers. The Advanced Teacher Training College has a number of computers. At the primary teacher training level dissertations are now being written. The essence is to inculcate research attitude in teachers. Cameroonians are encouraged to write out textbooks. To promote professional qualities in the various parameters, the different schedules should be systematised so that they respond to general needs.

There are many identified areas of needs as concerns teacher skills and knowledge. These innovative programs attempt to foster professional growth up

a specialisation ladder. What is most needed therefore, are teacher educators who themselves are good models for their teachers. They can only be good models through training, school experience as classroom teachers, participate in workshops, seminars, research conferences. They should be current with new trends and knowledge in education and its pedagogy. At least, these can subscribe for different journals or exploit the available libraries and teacher centres for new information about what other are doing around the globe. With increasing global change in the world that now seems as a global village, a kind of global professional culture seems to be emerging. Modernisation which is the central focus of this culture demands many new skills. As observed, no one nation can do it alone.

The world as a "global village" means we have much to learn from each other. This is the basis for the concept of interconnectedness. Collis (1991) argues that an important move in interconnectedness is to ensure supporting mechanisms for better information exchange and integration among professionals in education in different countries. This should be enhanced through countries' involvement in telecommunications-based learning. Finding a way to better learn from each other should be one of the major goals of members of the teaching profession at all levels.

Exposure to the experiences of others and modernising agents, necessitate network for effective collaborative work. The 21st century's demand, requires a totally different type of educational orientation in its content, instructional strategies, learning types and evaluative strategies.

It is hoped in the light of these discussions, that teacher educators should engage in more meaningful research endeavours, which would throw more light on the teaching process and necessary professional qualities that would enable them educate and train better teachers.

Other innovations are in the administrative and organisation dimension. Schools are gradualiy being allowed some financial and administrative autonomy. School boards have been created with stakeholders as members of the board. Teachers would need a more flexible characteristic to deal with outsiders in what use to be closed to them. There is a move towards community-based participatory approach.

In addition to the above innovation, teacher centres have been created in some provincial capitals as a basis for promoting professional qualities. These centres provide rich material resources for teacher support. Teacher quality,

depends heavily on competencies of the teacher among other aspects. These centres provide also the opportunities for teachers and teacher educators to meet and share experiences and socialise as professionals. These can be relevant and meaningful if the organisational and social factors provide, respond positively to teacher's personal needs. Some of these are prestige, improved salaries, opportunities for career growth through career-long learning and development.

Communication Technology

To promote the concept of interconnectedness in the world through teacher education, advance technology would make a great impact. The appropriate use of communication technology system would empower teachers by providing them with access to information. Such information are as important to the society as to the personal development of individuals. Information must be disseminated at all cost without which there would be no education. We recognise that communication is a vital element for effective information and education. There is need for networks as channels for information. Access to technology is crucial to assure linkage with other professionals in the nation, sub-regions and international level. More of the world's information education and news have been provided by electronic media such as the radio. In Cameroon, this is not only accessible but affordable. The use of television has also increased. These are found in some of our classrooms and schools. In most cases, where these are available, they are provided by parents. There are some striking international communication breakthrough in Cameroon through the introduction of communication satellites. Besides the radio and television, there are other models such as: fax, computer, Internet, E-mail and others. This incredible technological development has enormous implication for the informal learning for teachers. Teacher education can never provide all it takes for career-long learning in professional development. The advances in technology offer wide ranging opportunities for different forms of instructions. For example interactive satellite video-conferencing is becoming a regular part of in-service training. In addition, audio-teleconferencing and audio-graphic technology provide other opportunities for interactive dialogue through telephone lines and computer network (White 1993). These new strategies though far from the reach of some countries, they are worthwhile for enhancing teacher's professional development.

Conclusion

The ultimate responsibility for the promotion of professional qualities for an

interconnected world is a great innovation for teacher education. Teacher education is under great pressure and challenge to meet the demands of the 21st century. We need to use an advanced communication network created among African countries and other regions of the world. Through this there can be exchange and access to information from other experts. There should therefore be a world-wide satellite-based teacher education information network with a sub network users interconnected by telephone lines within each country. It can access information from outside through radio links with satellite in low earth orbit. (Kwankam & Tchombe 1993).

To ensure the interconnected world concept, we need to develop concepts, common programs, create networks and clearing houses to provide continuously updated research findings, innovations and new practices to promote professional qualities. With this trend the partnership that this creates will foster the reconceptualisation and restructuring of teacher education for the future. By ensuring that teacher education respond to the call for an interconnected world, focuses not just on teacher training but on measures which would integrate Cameroonian teachers and teacher educators and the community of teachers at large. The global professional culture concept will be fostered and interconnectedness pursued, ensured and sustained.

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TEACHER AND PARENT ATTITUDES ABOUT THINKING SKILLS: A CROSS NATIONAL STUDY

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ABSTRACT

Teaching approaches used in the kindergarten and primary grades form the foundation for the thinking skills of upper level students. Those early beginnings also form the foundation for the thinking skills that are used throughout life. If children are going to develop the requisite skills for problem solving and later learning, teachers need to teach in such a way as to enhance the development of thinking skills, and parents need to do their part in the home environment.

Samples of Parents and Teachers in the U.S. and Singapore were interviewed about their definition of thinking skills, the value of thinking skills for children, the usefulness in the classroom and usefulness in the years ahead. They were also asked to estimate the percentage of classroom time which is devoted to development of thinking, and to explain the role of parents and the role of teachers in the child's acquisition of thinking skills.

The results show that both teachers and parents say they place high importance on thinking skills. Defining or giving examples for thinking skills, however, is more difficult and both teachers and parents struggled to identify what thinking is all about. Teachers and parents need better understanding of thinking processes and their roles in enhancing thinking skills in children. Teacher training should directly address the ways in which teachers can teach thinking skills, and ways of getting support from parents.

Introduction

We may not pause the say to ourselves I think, therefore I am as we go about our day to day existence, although the French philosopher and mathematician, Descartes, believed that we exist because we think.

The teacher's daily plans may include a wide variety of activities which require reflective thought or problem solving on the part of the children. Teachers continually must engage their minds and utilize thinking skills as they teach. Whether or not we consciously think about our thinking, no tasks can be accomplished or routines carried out without the use of thinking processes versus automatic reflexive responses. The view of the individual as a life-long learner implies that one continues to think throughout life. The assumption that students learn implies process as well as content. We should be more interested in thinking than in the simple memorization of facts, yet often educators and parents seem more concerned about what the child "knows" rather than how the child learns or applies the knowledge.

Teacher and Parents are often disagree about both pedagogy and curriculum content, especially when a child first begins school. Some preschool, kindergarten and primary teacher s claim that they put emphasis on facts and drill in the classroom because parents insist on it. Regardless of the source of the classroom curriculum, or the forces which determine teaching methodology, there are implications for the future. The curriculum and teaching methods used today in the preschool, kindergarten and primary grades, are laying the foundation for the thinking skills of upper level students.

Little is known about the attention which is given within the classroom to the development of thinking skills, or whether teachers and parents are aware of the importance of devoting attention to that development.

Procedures

Samples of teachers and parents of young children in Michigan, USA and in Singapore were surveyed about their beliefs related to thinking skills. The interviews were geared to spontaneous responses and personal opinions. The goals included investigating differences between teacher and parent perceptions of the value or usefulness of thinking skills within the context of the school setting, in life in general, and possible cultural differences between the Michigan and Singapore respondents. Interviews do not yield the precise data which can be thoroughly analyzed for lengthy listing of statistical facts and tables. The data collections procedures and the general wording of the

questions make it both unwise and impractical to attempt detailed analysis. Therefore, this paper focuses on general findings and implications.

Method and Sample

The sample consisted of 120 subjects divided into four groups of 30 subjects each: Teacher and Parent samples in the US and Teacher and Parent samples in Singapore. All US respondents were individually interviewed. The Singapore samples filled in a questionnaire with questions similar to those in the US interviews. There was slight variation in the wording of a few of the questions for the two nations and the U.S. interviews included more questions.

All subjects were asked to define thinking skills, responding with "any words or phrases that come to mind as a definition or explanation of thinking skills." The other common questions which occurred in both nations dealt with the usefulness of thinking skills for the young child both inside and outside the classroom, their perceptions of how children will use thinking skills in the future, and their perceptions of the role of teachers and parents in developing thinking skills in children.

The questions used for the U.S. Sample were as follows. The alternate wording used for teachers and parents is indicated by parenthesis.

1. To begin, can you tell me how you would define thinking skills? Just any words or phrases that come to mind as a definition or explanation of thinking skills.
2. What do you see as the value of thinking skills for young children ages 0-8 (such as in your first grade) (such as for your (7) year old)?
3. What about the usefulness in the classroom? What thoughts do you have about that?
4. A. I know you cannot give an accurate answer to this, no one could, but what do you think might be the percentage of time do you think is spent on thinking skills in (your classroom) (on a typical day in an elementary classroom) (on a typical day in your child's classroom)?

B.. Does that percentage seem about right to you? (Not asked if answer was given/implied in response to A.)

5. What about the usefulness of thinking skills outside of the classroom?...When they are outside of the school setting? (This question was often answered in the response given for question 2 above, and if so, the subjects were asked if there was anything further they wished to add.) 6

What about the usefulness of thinking skills for your child/children in the future? Let's say, when your ((first) graders) (your daughter) turn(s) 16. Will their (hus.her) need for thinking skills be the same? Different? Will they use them in the same way?

7. Do you think that teachers should TEACH thinking skills? That is, should that be something they deliberately plan for and include in each day?
8. What do you think is the parents' role in developing children's thinking skills?
9. Could you tell me something about how you, as an adult, use of thinking skills?

At the end of the interview, subjects were asked: Is there anything else you wish to add?

Results

The teacher and parent responses tended to fall into three main categories. The answers from the respondents would not clearly place each teacher or parent within one single category for sometimes an individual would reflect two different views during the interview. However, the answers from the total sample reflected these views of what thinking is and when and how it is utilized.

I. Limited, academic view of thinking as related primarily to use in school work and/or the adult's work place, with thinking skills relatively isolated and utilized sporadically.

II. A view of thinking skills as useful, important, helpful with understanding in general, and related to academic achievement (perhaps in specific subjects) and/or as a focus of part of the school day.

III. A broad, all-encompassing view that points out it is difficult to separate out thinking skills.

Thinking skills are seen as crucial to all that we do and related to virtually 100% of our day and/or life.

While recognizing that informal interviews or short questionnaires are not always reliable measures of respondents' beliefs, there are some interesting observations which can be made based on the data. The answers were coded for application to a number of categories which were derived from studying the responses to the questions: problem solving; decision making; application of

knowledge; thinking related to social and/or moral situations; and as a process for building upon prior knowledge.

The themes from teacher and parent responses include:

1. Thinking is a process, but products are more easily identified than processes. Many parents and teachers spoke to the answers a child can give, rather than the process used to get the answers.

2. Over 1/2 of the teachers cited such approaches as encouraging children to observe, to reflect on cause and effect, and to consider options, especially in relation to helping children become aware of appropriate versus inappropriate behaviors.

3. Many respondents give answers which noted that thinking skills are crucial to everything in life. These responses often came out toward the end of the interview, after the respondent had been "thinking about thinking" for a while. A second grade teacher, towaard the end of her interview, said "We can really get global about this. The world needs good thinkers and workers. It affects the general health of our country. You don't have a healthy, active democracy if you don't have good thinkers." Other respondents similarly broaded their views as they talked.

4. Both teachers and parents noted the importance of modeling. Examples: teachers modeling problem solving approaches and verbally pointing out to children that they are considering various options before arriving at a decisions, and parents telling children about the thinking processes which they use.

5. Some teachers noted the importance of encouraging the development of thinking skills through asking questions, supporting curiosity and creativity, and praising inquisitiveness and independent thinking. Fewer parents had this broad view, although many moved toward that as the interviews progressed. (The interviewer did not interject options or information, but only asked the questions and encouraged elaboration.) One father, a physician, noted that thinking skills "are the software for the computer" and other parents noted how they "couldn't get through the day without thinking about what I need to do when".

6. Teachers, acting alone, cannot do all that is necessary to develop thinking skills and teachers and parents alike spoke to weaknesses in the way that the other's role is carried out. Four teachers gave very strong statements about parents not providing enough guidance for children. While teachers

were critical of parents' failure to see the important of relaxed, personal interaction with their children, a few parents gave lengthy responses about teachers only being concerned with academics. Those parents said that teachers should be doing more to teach children how to interact with others, conflict resolution in social situations, and the interpersonal skills that will "make a difference to them later".

7. Some teachers and parents were uncertain about how thinking skills might be taught, one mother going so far as to say that her son would be bored if the teacher tried to teach something he does on his own automatically. Others did see that there would be much time "with everything else they have to do in school. These are the responses which should concern us when we think about implications for both parent education and teacher training

Discussion

Current trends in education, including outcome based education, performance based assessment, and constructivism, can serve as linkages for connecting both teachers and parents. Making both teachers and parents aware of the value of looking at the application of what is learned, of basing evaluation of learning on what a child does, and how he constructs his knowledge, could lead to more mutual understanding of the value of thinking processes for the young child.

Teachers may do more in the classroom to support thinking skills than they give themselves credit for. For example, a public school kindergarten teacher (teacher of 5 year olds) gave multiple examples of the activities she uses in her classroom to promote early literacy, to make connections between a child's interests and school work, using terms like "metacognition" and mentioning Bloom's taxonomy, Piaget and multiple intelligences. Her articulate, enthusiastic responses outlined a commitment to hands-on, process oriented learning and the development of creative thinking. Her classroom is developmentally appropriate with an emphasis on understanding of both concepts and relationships with children engaged in thinking about their thinking. She commented on the challenging decisions required of teenagers but said that if you help children become good, independent problem solvers they are empowered in adolescence. Yet for the question of what percentage of time is spent on thinking skills in your classroom, her spontaneous answer was only "20%".

Other teachers, perhaps, give themselves more credit than they deserve. Some respondents spoke emphatically about how important they feel thinking skills are for children. The illustrations they used for how this is taught in their classroom referred to the questions they ask at story time, which would require convergent, not divergent answers, and specific skills areas such as math, where children are completing their work correctly. The majority of answers from some teachers indicated that to them children are using thinking skills when they come up with correct answers on the daily work. In turn, their views of the usefulness of thinking skills at present and in the future implied that this precise knowledge would serve as the foundation for more challenging academic work. This did not broaden into more general applications in any of their responses.

Some teachers and parents in the U.S. sample, regardless of whether they personally took a didactic or more flexible view of thinking skills, showed concerns for decision making abilities in adolescence. The concerns reflect current societal problems with teenage self control, underage drinking and teenage driving. While this may not be what was expected as how parents and teachers view the overall need for thinking skills, it provides a clear message. The concern about decision making and weighing options and predicting outcomes for young people should provide a fertile ground for planting the seed for teaching and placing emphasis on developing problem solving skills, making choices and engaging in conflict resolution at an early age.

Implications for Teacher and Parent Education.

There are implications from the research findings for teachers, parents, teacher educators and for those who have influence on educational policy and school curriculum. If there is strong belief in the value of thinking skills, teachers need to teach in such a way as to enhance such skills, and parents need to insist that it is done.

A possible correlation between the thinking processes used in decision making in the early years and the thinking processes used in decision making and independent thinking in adolescence was clearly recognized by some of the responses. However, there appears to be a need to help both teachers and parents become aware of the importance of the overall ability to make informed choices and to consider options in problem solving in school and the relationship with life outside of the classroom.

Implications for teacher training include the need for hands-on experiences.

Castle (1997, p.59) writes of the value of incorporating contructivist approaches in teacher training, with increased ability of students to understand the value of hands-on learning, to articulate that understanding to themselves and others, and to apply those techniques in the classroom.

There are implications also for matching assessment practices to expectations. Traditional assessments are less descriptive and comprehensive than performance-based assessments such as observations of what the child does and asking the child to engage in thinking about her thinking. Parental understanding of the value of both performance-based assessment and the importance of thinking processes should increase as teachers use this approaches in communicating progress to parents.

It was interesting to note the broadening view of the importance of thinking skills, how they are acquired and how they are used, as the interviews progressed. Does being interviewed help us to think through/reflect on what we believe? If teachers were required to think about thinking, to reflect on the acquisition of, and reinforcement for, thinking skills, would this lead to a change in beliefs and/or teaching practices? The implication for teacher training would be that such reflection needs to be emphasized prior to teaching in a classroom.

Messages to parents from research include that while research shows that the child is capable of learning from birth, the child does not develop optimally without parental stimulation. Parents are encouraged to talk with their children, to provide interesting, interactive toys and play opportunities, and worry more about quality time with their child than teaching them to read. (Begley, 1997. 32) Good parenting skills could be linked to the developing of those mental operations of sequencing, observing. Parents who are aware of the role of their reinforcement and interaction with the child could help not only the child's performance in the early years of school work but also with thinking skills in adolescence.

The responses which should attract our attention are those in which parents gave which did NOT see the primary role of parents, those from teachers which only recognized the need for parental support for what is being done in school, and those from both groups which saw it as intuitive or next-to-impossible to "teach". It was disappointing that more teachers did not express an awareness of the direct role of teachers in developing strategies for higher level thinking skills. One teacher said that her goal was to help children reach to "higher level thinking skills" but could not come up with a description or example of higher level skills.

HRH Crown Prince El Hassan of Jordan, in the opening address to the International Council on Education for Teaching World Assembly in Amman, Jordan, December 1997, said:

"Schooling must generate teaching-learning processes that facilitate the development of critical thinking tempered by humanitarian values, as well as scientific and artistic creativity, social responsibility and effective communication skills."

Dynamic and creative environments that provide opportunity for constructive interpersonal interactions, for cooperative problem-solving and consensual decision-making will enable children to be more capable of conflict resolution and peaceful interactions in the future.

Teaching facts will not totally prepare children for the new millennium. Finding ways to help them to become problem solvers, negotiators, dynamic creative thinkers and individuals capable of positive social interactions is essential.

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Innovating A Teachers Training Program For A Qualitative Jordanian Art Education

Dr. Kayed Amr

Art was synthesized with education by the beginning of the twentieth century; it was cited within the educational curricula by a few industrial countries, as a means for training children and adolescents to acquire some artistic skills in order to work for some manufacturers as designers. This attitude started in both countries, England and America, which means that art education had to serve only the goals of the manufacturers, which was the sole target of the curricula makers.

By the third decade of the century, curricula started to develop and to include other aspects, which reflected some fine art skills, that made art education more humanized, then developed more to meet young students' needs for personal fulfillment. It became an educational field centered around three main goals, as for Chapman 1978.

- Personal fulfillment through art.
- Understanding the artistic heritage.
- Understanding the role of art in society.

Accordingly, art education is a realm within which individuals attain self integration, understand art forms of their heritage, and the heritage of others, and finally, to know the importance of both fine and applied arts' function in society as means for knowing, why, how, and when individuals produce art.

As an educational field, it was supposed to introduce different realms of both fine and applied arts, not to prepare learners at public schools to be professionals, but to enrich and expand their frame reference within these fields as a forestep toward future career, besides personal needs of the students. The role of art education within school curricula is supposed to be parallel to the roles of other fields of the school curricula. If mathematics provides children with numerical language for future career and personal inquiry, art education has the same targets and importance in educating individuals, neither more nor less.

But the case of such realm has been applied differently. It started to deviate from its' right track when some educators spread the uncertain findings of their studies to centralize upon children's art as a spontaneous activity. Among those

was Victor Lowenfeld, 1974 who affected American and European art curricula with his developmental theory, which pervaded most of the art curricula around the world, including the Arab countries' art curricula by the second half of the century.

*** The Case of Art Education In Jordan.**

Art Education in Jordan took its place within the public school curricula by the beginning of the second half of the century. It has been obviously influenced by the Western current in art education, and mainly by the American theorists, especially, Victor Lowenfeld. This influence occurred in two ways, the first came according to direct contact with the American institutions, the second came as a result of contacting some of the neighboring countries such as Egypt, through those educators who had joined the American institutions, and conveyed the findings of the developmental theory of Lowenfeld to their institutions in the Arabic language. The second influence seems to be more effective, because the developmental theory through Arabic text books pervaded most of the Arab countries within few years.

Whilst changes and developments took place within the curricula of most western countries, so far, there seen to be no lapses for development in art education within the educational curricula of the Arab countries, including Jordan. The passive effects of Lowenfeld's developmental theory underlie its misinterpretation of the artistic process, for it explained art activity as a behavior governed by innate factors. Also, it concentrated upon children's artistic unfolding, rather than including all ages of students.

Accordingly, teachers' training programs had to be founded with great emphasis on children's art, on how to deal with children. Moreover, methods of instruction within teachers' training programs excluded visual training, considering art as a spontaneous activity even for adults, which later on influenced public schools' art curricula, and then the students' skills and knowledge passively. This attitude still exists among art teachers and curriculum planners in Jordan.

Accordingly, art education has lost its actual role in society. It was supposed to provide teachers and students with skills useful to other art related realms of future careers. Even art teachers who supervise student teachers, guide them toward non-visual activities, hence; one cannot perceive any visual experiences in their drawings, paintings, or graphic design.

Problem Definition.

1- There are missing links between Jordanian art teachers and essential realms concerning visual arts and crafts in theory and practice.

2- Teachers who had joined art education programs in the Jordanian institutions, reflected their experiences upon their students at public schools and in school curricula.

Research Goals.

1- To investigate the existing role of art education among Jordanian art teachers, in light of which, one could define passive and positive aspects, to be taken into consideration for reforming teacher's training art programs.

2- To provide Jordanian teachers with an effective art program, that matches their needs for learning and teaching, which could meet the needs of the twenty first century.

Previous Studies.

Efforts in art research, and curricula reformation and development started as early as four decades ago, when American art educators and some of their European partners started innovation toward activating the role of art education in society. In his educational philosophy Bruner 1963 called for a concern with the discipline of the subject, which came parallel with the techno-scientific wave of development in America. Since the 1960s, Eliot Eisner called for changes and reforms in art education. He noticed that art education was centering upon children's arts as it's main substance. In 1980, Discipline Based Art Education started. In 1987 Eliot Eisner published two articles in which he attempted to define the role and forms of Discipline-Based Art Education. Eisner believes that the perceptual skill cultivated in an art program enables a student to enjoy his/her environment for what it is, he devoted his research to change the previous methods of art education, within which he reinforced the new trends in American Art Education.

In 1984 Greer proposed that art has structures and disciplines that may be taught by means of a formal, continuous, and sequential curriculum. He says: "Discipline Based Art Education was to produce educated adults who were knowledgeable about art and responsive to the aesthetic properties of works of art", P. 212.

Harry Broudy 1983 focused the instruction of art education on four disciplines, of art: aesthetics, criticism, history, and production.

Other art educators approached the innovations, such as Clark, J., 1987 Michael Day, and Broudy 1987.

Discipline Based Art Education started to revive aspects that originated in the 1960's. These aspects reflect the type of academic courses to be taught at different stages of art education, such as art history, aesthetics, art criticism and studio arts. In 1982 Lura Chapman noticed that art education needs actual reform. She claims that prevailing social attitudes toward the arts have affected art education practice, in spite of being invalid.

(Cuban, 1984) sees that teachers' own education is their first model, they often tend to teach as they were taught. Cuban put more emphasis upon teacher training. He implies that good training means effective teaching.

Salome, R., 1978, criticized the developmental theory to defend modern research, and confirms that research brought new findings to the field. He himself contributed to the development of art education.

David Ecker, 1972., contributed to the development. Feldman 1970, McFee John 1977 stressed the importance of visual experience for all. Ralf Smith from 1966 up to 1994 was very keen toward excellence in art education. Wilson, B since the 1980's up to now, has been involved in research to change the passive concepts of the developmental theory. Many more researchers contributed effectively to the field. So far, art education in Arab countries seems to have made faint efforts toward innovations.

Research Hypothesis.

1- Art teachers at Jordanian public schools are expected to look for a contemporary concept for art education in both theory and practice.

2- They are expected to have the intention of improving their total capabilities through innovations, to develop their vocational performance.

To test the hypothesis, six categories developed with four sub queries each. The categories included :

1- Visual and manual skills, 2- History of art, 3- Art criticism, and awareness, 4- Light media , 5- Computers 6- Foreign languages.

The queries of each category were centered around two main goals which relate to the hypothesis, the first is to discover the capabilities of Jordanian art educators. The second is : to know to what extent they desire innovation and self development for the interest of their vocational performance in art education.

Population of the Study.

The population included forty Jordanian art educators from different districts, in Jordan, with a diploma in art education from the Jordanian Community collages, previously and recently.

Analyses of Data

A Questionnaire For Assessing The Affective Role of Art Programs Upon Art Educators In Jordan

Teacher's Experiences of previous Studies And the Intention To Develop Them	Agree Strongly	Agree	Not Sure	Don't Agree	Never Agree
Firstly : Visual and Manual Skills :					
1. You studied the basics of geometrical perspective.	2	5	–	3	30
2- You've passed through a variety of visual experiences through direct vision, in both drawing and painting.	3	2	–	15	20
3- You have received instructions how to discriminate between similarities and differences through visible objects.	–	9	–	17	13
4- You have the desire to study drawing and painting through direct vision.	28	8	4	–	–
Secondly : Art Criticism And Awareness:					
1- You learnt the basic steps of art criticism.	–	–	11	24	5
2- Your identified with basics of criticism.	9	2	29	–	–
3- You experienced a variety of art works visually, both local and universal.	6	2	–	12	20
4- You have the desire to learn more about art criticism.	3	30	7	–	–
Thirdly : History of Art :					
1- You went deeply though historical periods of world art.	–	7	5	8	20
2- You used to see samples of art work for each artist and each period with description and analyses.	–	2	2	19	17
3- You can distinguish schools of art and related styles.	5	3	7	16	9
4- You have the desire to restudy history of art to deepen your experience.	13	22	4	2	3
Fourthly: Light Media.					
1- You learnt how to use the camera, film developing, and printing.	–	–	1	5	34
2- You learnt how to use visual media concerning art..	2	13	3	4	18
3- You can produce different visual media.	3	7	2	9	19
4- You desire to enrich your experience with educational technology.	9	23	5	3	–
Fifthly: Computer.					
1- You received computer training at your previous studies.	–	3	–	5	32
2- Computer is useful for teaching and producing art.	7	18	15	–	–
3- You think it could be a means for creativity and quick accomplishment.	10	5	12	13	–
4- You have the desire to acquire it.	4	17	9	6	–
Sixthly: Foreign Languages.					
1- You studied one foreign language or more.	8	11	–	7	14
2- You speak a foreign language fluently.	2	5	9	8	16
3- Foreign language is useful for art teachers.	13	16	7	4	–
4- You have the desire to learn foreign languages.	15	17	5	3	–

Sample of the questionnaire with total frequencies of the answers for each category.

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The expectations of the two hypothesis have been confirmed with some disproportion among them. The percentages of each category, including the answer for their sub-queries came as follows :

Firstly : Visual and Manual Skills :	**Agree Strongly**	**Agree**	**Not Sue**	**Don't Agree**	**Never Agree**
1. You studied the abscise of perspective.	5%	12.5%	-	7.5%	75%
2- You've passed through a variety of visual experiences through direct vision in drawing.	7.5%	5%	-	37.5%	50%
3- You have received instructions how to discriminate between similarities and differences through visible objects.	-	22.5%	2.5%	42.5%	32.5%
4- You have the desire to study drawing and painting through direct vision.	70%	20%	10%	-	-

The answers indicate that art teachers in Jordan acquired no visual experiences through years of previous study. Some experiences might have occurred to some of them as an individual activity. The percentage of answers for question four indicates the Jordanian teachers need for a visually oriented studio courses.

	Agree Strongly	**Agree**	**Not Sure**	**Don't Agree**	**Never Agree**
Secondly : Art Criticism And Awareness :					
1- You learnt the basic steps of art criticism.	-	-	27.59%	60%	12.5%
2- Your identified with basics of criticism.	15%	5%	-	30	50
3- You experienced forms of art visually, both local and universal	15%	5%	-	30%	50%
4- You have the desire to learn more about art criticism.	7.5%	75%	7.5%	-	-

The percentage of each frequency within the answers indicates that art teachers have a minor understanding of art criticism, with no practical experience. It also refers to their desire to improve their knowledge, but the percentage of the total group seems to be a little lower than expected, probably because the way art teachers apply art criticism which in effect made that made some of the group unenthusiastic to study art criticism.

	Agree Strongly	**Agree**	**Not Sure**	**Don't Agree**	**Never Agree**
Thirdly: History of Art:					
1- You went deeply through historical periods of world art.	-	17.5	12.5%	20%	50%
2- You used to see samples of art work for each artist and each period with description and analyses.	-	5%	5%	47.5%	42.5%
3- You can distinct schools of art and related styles.	12.5%	7.5%	17.5%	40%	22.5%
4- You have the desire to restudy history of art to deepen you experience.	-	55%	10%	5%	7.5%

Art history experience among teachers reflects a low level of basic understanding and skills, the desire to improve cognitive abilities seems to be normal but not outstanding, which probably reflects the misconceptions about history of art, and the misunderstanding of the actual role of art history.

Fourthly: Light Media	**Agree Strongly**	**Agree**	**Not Sure**	**Don't Agree**	**Never Agree**
1- You learnt how to use the camera, film developing, and printing.	-	-	2.5%	12.5%	85%
2- You learnt how to use visual media concerning art..	5%	32.5%	7.5%	10%	45%
3- You can produce different visual media.	7.5%	17.5%	5%	22.5%	47.5%
4- You desire to enrich your experience with education technology.	22.5%	57.5%	12.5%	7.5%	-

Most of the art teachers seem to have poor concepts about light media, such as Video Camera, and projectors. The majority tend to produce manual forms of teaching media. They show great desire to develop their skills in light media.

Fifthly: Computer	**Agree Strongly**	**Agree**	**Not Sure**	**Don't Agree**	**Never Agree**
1- You received computer training at your previous studies.	-	7,.5%	-	12.5%	80%
2- Computer is useful for teaching and producing art.	17.5%	45%	37.5%	-	-
3- You think it could be a means for creativity and quick accomplishment.	25%	12.5%	30%	32.5%	-
4- You have the desire to acquire it.	15%	42.5%	22.5%	-	-

The computer is another type of light media. It has a special nature which reflects the highest capacity among modern media educational. The percentage of the total group within the negative answers refers obviously to the full lack of computer skills and information. This relates to the gap that exists within the training programs. Teachers seem to be unaware of computer capacity, as they need to acquire it with a few reservations among some of them.

Sixthly: Foreign Languages	**Agree Strongly**	**Agree**	**Not Sure**	**Don't Agree**	**Never Agree**
1- You studied one foreign language or more.	20%	27.5%	-	17.5%	35%
2- You speak a foreign language fluently.	5%	12.5%	22.5%	20%	40%
3- Foreign language is useful for art teachers.	32.5%	65%	17.5%	10%	-
4- You have desire to learn foreign languages.	65%	37.5%	12.5%	7.5%	-

Foreign language seems to be unpervasive among teachers. The answers indicate that teachers confirm the importance of foreign languages to art education. They showed strong response to learning languages.

Conclusions:

In light of the previous data analyses and the information provided by the Ministry of Higher Education in Jordan, specific and detailed aspects of the problem existing among art teachers could be defined as follows :

1- The majority of art teachers in Jordan still believe that art is personal behaviour, it must be left to the person to develop alone without intervening directly by teachers.

2- Teachers are trained to teach at childhood stages at schools, which makes them unqualified for teaching older stages of intermediate and high school stages.

3- Visual experience and related hand skills are still missing within training programs as shown within course description, and teachers' attitudes.

4- Art history and art criticism both lack for depth and width, besides to the missing interrelation between the two.

5- Teachers lack for light media skills and information.

6- Teachers' in-service and training both lack for modern technology, such as computers and related activities.

7- Three-dimensional design has been unknown as a forestep for art forms of different crafts.

8- The role of art education for students' need and in society has been unknown among teachers and curricula planners, as is shown within the courses offered within fine art programs at the Jordanian institutions.

9- The Jordanian institutions lack for effective and modern art education programs.

Accordingly, art education in Jordan needs to be discipline based with multi-purpose training programs that could provide teachers with skills and information to be qualified as teachers and artists. Teachers must be qualified for teaching at advanced stages in school, which needs (hand-eye) full experience, besides to deeper and comprehensive knowledge and experience within (history of art and art criticism) These two will contribute to qualifying teachers with the core knowledge of the profession essential for capable teachers.

A model For Teachers' Training Program In Art Education.

Firstly: Goals For The Program.

1- To provide teachers with skills and related information based on visual deep experience.

2- To train them as art teachers, artists, and art critics within a discipline based art education program.

3- To provide the Jordanian public schools with qualified teachers for all stages of childhood and adolescence.

4- To actualize the role of art education in society by providing teachers with skills and information which accommodate needs of the community within different art related fields concerning life.

Secondly: Program Conclusion.

To attain the expected goals, the following courses are recommended.

A- Academic Studio Courses.		
1- Geometrical perspective	6. Cr. H	2 courses
2- Drawing	9. Cr. H	3 courses
3- 3 D. Design (crafts of 3D.D)	6. Cr. H	2 courses
4- Graphics (print making and graphic design).		
5- Painting	9. Cr. H	3 courses
6- Sculpture	9. Cr. H	3 courses
7- Ceramics	8. Cr. H	3 courses
8- Light media and Computers.	9. Cr. H	3 courses
9- Textiles and other crafts (2D.D)	6. Cr. H	2 courses
10- Experimental work	3. Cr. H	1 course
B- Academic Theoretical Courses.		
1- History of art	12. Cr. H	4 courses
2- Art Criticism	6. Cr. H	2 courses
3- Aesthetics	3. Cr. H	1 course
4- Child art theories	3. Cr. H	1 course
5- Adolescent art	3. Cr. H	1 course
6- Developmental Psychology.	3. Cr. H	1 course
7- Foreign Languages	12. Cr. H	4 courses
8- Statistics.	3. Cr. H	1 course
C- Vocational Courses.		
1- Methods of instruction in art education	6. Cr. H	2 courses
2- Curriculum foundations and its planning.	3. Cr. H	1 courses
3- Practical training.	6. Cr. H	2 courses

Total 135 Cr. H.

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Thirdly: Goals For Eeach Course:

Course Title	*Goals*
1- Geometrical Perspective.	To Learn about visual dimensions of the object. To learn how to see, and see to learn about the forms and shapes. To establish visual concept about things as they show explicitly. To learn the basics of the visual language as a forestep for other fields of visual arts.
2- Drawing.	To learn how to present things and objects in line. To learn how to perceive forms and proportions. To learn about the aesthetic value of line. To acquire the skill of describing visual objects accurately. To acquire the skill of building forms with line, shades, and light. To gain a deep vision in the environment.
3- 3-D. Design.	To know how to plan forms and interpret ideas though three dimensional forms. To plan other forms of art through accurate visual forms.
4- Graphics	To learn how to produce two-dimensional design. (advertising and others). To learn basic steps of print making. To practice some forms of typing.
5- Painting.	To learn about colors, and their techniques. To produce forms of visual qualities. To acquire skills of direct painting with colors.
6- Sculpture.	To learn about material and it's application within three dimensional forms. To produce forms with different materials to experience aesthetics of three dimensional forms.
7- Ceramics.	To learn about it's history and function in society. To learn about its materials, and ingredients with techniques related to them. To acquire skills and knowledge for future career.
8- Light media and computers	To learn how to make visual aids for teaching. To acquire skills for more creative teaching. To produce forms and shapes faster. To store information for urgent situations. To create forms of art for one's own self.
9- Textiles	To learn basic skills of textiles. To practice and design textile forms. To produce forms of some folk and traditional crafts.
10- Experimental work.	To experiment with different mediums and tools. To create forms of different arts . To deepen one's own experiences as a step for personal styles.
11- History of art.	To learn about art and artists throughout the human history. To acquire visual experience through forms of art of different artists and schools within different visual art realms. To acquire artistic terminology and vocabulary as part of the artistic language. To learn about problem solving through forms, mediums, and styles.
12- Art criticism	To learn about forms of art, their elements and structure. To learn about forms of art and their functions. To acquire the skill of describing, analyzing, interpreting, and judging forms of arts. To establish concepts about styles and schools of arts for aesthetic and artistic taste.

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Course Title	Goals
13- Aesthetics.	To study the philosophy of art and its value. To learn about different aesthetic theories of art, to establish one's own philosophy, for judging art forms and topics.
14- Child art theories.	To understand the nature of children's graphic images and other art forms. To know the influences that affect children's art. To learn how to deal with children and guide them toward total development in art.
15- Adolescent art.	To learn about adolescents and their art. To know the main influences affecting their artistic growth. To learn how to deal with them through art and guide them toward artistic development.
16- Developmental psychology	To learn about the main aspects consisting the human personality. To learn about the influences that affect human beings and how could they be controlled.
17- Foreign languages.	To learn how to read, write, and speak other languages. To express one's self for others from cross-cultural societies. To acquire knowledge and experience from others. To keep abreast with new knowledge and creative research.
18- Statistics.	To learn how to study scientific phenomena. To learn how to issue a decision concerning specific area within art. To acquire a skill for other purposes of life.
19- Methods of instruction in art education	to learn how to deal with children and adults at school. To acquire the skill of conveying information to others. To learn how to select and establish topics relevant to students' needs.
20- Curriculum foundations and planning.	To learn about how curricula planners establish and form curriculum. To learn about the main aspects of effective art programs. To acquire the skill of planning curricula.
21- Practical training.	To practice teaching at different school stages. To apply previous knowledge and skills through practice.

Research Recommendations.

To actualize this program, the following are recommended.

1- Professional teachers with high competencies in both theory and practice (with strong emphasis upon visual skills). are recommended.

2- Modern teaching , and learning sources, such as books, supplies and equipment.

3- Place and finance must be available, which will strongly support the successful application of the program.

4- Electing students with special abilities in art, and limiting the numbers for the program, for the interest of high qualification.

5- Encouraging all types of research in art education.

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INTERFERENCE DUE TO THE USE OF THE INTERNET IN THE EDUCATION OF THE ADOLESCENT

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The study attempts to identify the implications of the use of the INTERNET in the education of adolescents between 14 and 18 years of age in the city of Brasilia, Brazil. The study, in an exploratory manner, seeks to specifically identify behavioral characteristics of these young adolescents in the school and in the family, in particular their values, attitudes, abilities and types of learning. The study is carried out in two schools: one of which is public, and the other private. Students, teachers and parents participate in the study. Questionnaires and interviews are used to collect data. Through academic transcripts a parallel is drawn between the results obtained by users and non-users of the INTERNET. The study will offer insights that can provoke changes in different domains: 1) At School: changes of conceptions, updating and changes in the curricular paradigms; more adequate planning of pedagogical actions and appropriate use of technology in the classroom; 2) In the Family: information to the parents that will facilitate the orientation of their children; 3) In the Educational System: curricular reformulation of the different levels and educational modalities, particularly of the teacher-training courses aiming at the Third Millenium where the globalization, cultural diversity and the use of technology will present themselves as great challenges for education.

INTRODUCTION

Reflections on educational problems, during recent years, have lead to several anxieties, among which the matter of the use of computer science has been considered as one of the most polemic.

Prioritization of science, which distinguished the modern paradigm, structuring the intellectual, social and educational world thinking, is being challenged by a new form of new paradigm that is being developed since the last decade of this century.

In the modern era science has become an obsession, in particular among the Americans, having transformed it into a dogma whose methods have dominated areas such as philosophy, psychology and educational theory. In the United States Americans came to believe that professional and scientific knowledge would help them compete with the Russians in space, defeat communism in Vietnam, eliminate poverty and improve health welfare, as well as increase the knowledge basis of the young. Teaching machines, programd education and a curriculum that is resistant to the teacher have appeared, considered them all as solution for social sustenance.

This type of understanding has transformed Science into the most valuable knowledge that has ever been absorbed worldwide. One of its greatest achievements was to place men on the moon, at the end of the 60's; one of its greatest defeats certainly was the loss of human lives in the dramatic and tragic explosion of the spaceship shuttle Challenger, two decades later. (Doll, 1997)

From then on America and, fortunately, the world started to perceive that theoretical rationalization and technical expertise were not able to make the Americans win the war against communism (it collapsed due to its own inertia), eliminate hunger or drugs, nor did it manage to balance the federal budget, maintain its low inflation or even maintain its leadership as one of the first nations in the world. (Doll, 1997)

Due to the failure to fulfill its many promises, modern rationalization is forced to criticize itself and reconsider its conceptions. It is obvious that all of this has everything to do with education and clearly shows the need to go far beyond the theoretical assumptions and instructional functions that have been attributed to it. It is evident that education has to rediscover its humanizing fundaments. "The concrete challenge for education is to seriously consider that a common genesis exists between the forms of learning and the forms of life" (Assmann, 1996: prologue). To the author, the worry of self-organizational

trauma of knowledge morfogenesis is that which distinguishes a communication and a pedagogical act from mere instructional practices and from drilling. This is because "the corporal inscription of knowledge happens through those self-organizational vibrations of corporeity, that has everything to do with the levels of self-esteem and expectations and not merely through the specific contents of different subjects". (Assmann, 1996; prologue)

These worries value the undivided relation between vital processes and knowledge processes, without falling into the trivial sense of dictation "living and learning", but in a much deeper sense of understanding that when learning fails life disappears.

This conception of education impulses from the second half of the XXth century with the studies of Husserl and Heidegger presenting a Philosophy of education based on Phenomenology. This educational approach replaces in the center of its anxieties the individual and matters relating to the BE and with what? to the WILL BE, and considers that education certainly is a social process.

From then on new visions and voices started to be heard whereby Cartesian or Newtonian assumptions were questioned. (Nielson, 1991; Schmittau, 1991 quoted by Doll, 1991)

In humanity, in particular in arts and political theory, a vigorous debate has been maintained during the last years on the nature and the structure of postmodernism. (Foster, 1993; Genre, 1987; Jameson, 1991)

In fact it is yet all very obscure. A consensus has not yet been reached on the condition of the project that will substitute modernism. It is not known how radical changes in different areas of knowledge, discussing basic epistemological and metaphysical assumptions of these fields will affect education and the curriculum. In fact, Assmann states that "it is time to learn that every certainty, apart from being foolish, usually is degenerating" (1996: 51). The author states that postmodernism, more than a method for analysis, is a new attitude towards things and in this way can teach us not to fall into excessive seriousness and shows us the ridiculous sides of our hyperbolic beliefs.

In this postmodernist paradigm, science will have a new order that Doll (1997) names as asymmetric, chaotic and fractional. That is different from the symmetric, linear, sequential and easily measured order, that classic science has borrowed from medieval thought, to give way to a more complex,

pluralistic and unexpected system or network. This new order will provide science with a completely new form, transferring it from its main position within a closed system, where its methodology was dominant, to a more eqalitarian position among many other methodologies, placing it in an open system.

Needless to mention the impacts of this new order on the educational system, in school and in the classroom. Doll dares to say that when this new order reaches the schools, the relations between teachers and pupils will change drastically and there will be a new concept of curriculum that "will not be seen as a determined 'racecourse', a priori, and will in fact be seen as a personal transformation passage". This change will give greater emphasis on the running corridor and on the resulting standards as many corridors run, and less emphasis on the racecourse, although neither the corridors nor the racecourse can be dichotomically divided. Traditional evaluation methods become irrelevant; authority becomes a communal and dialogical "here".

Fortunately, significant progresses deriving from new discoveries of bio-sciences and of cognitive sciences, on brain-mind functioning as a dynamic and complex system, coincide with the moment when the computer, the multi-media and INTERNET invade the school's environment.

Teaching that has been conceived as a transaction among minds (from the teacher's mind to the pupil's mind) is not compatible with that which bio-sciences and in particular cognitive sciences have discovered about life corporeity.

"All knowledge has a corporal inscription and supports itself on a complex sensorial interaction. All intelligence activation is a mixture of emotions". (Assmann, 1993: 33) Therefore, it is important to create pedagogical languages that will also express the emotional dimension of learning experiences. (Goleman, 1996)

This research's main preoccupation is precisely to identify whether learning deriving from the use of the INTERNET reaches the human being in its complexity and the morphogenesis of knowledge, or in other words, appearance of the forms to reach knowledge. (Assmann, 1996)

"Education only manages good results when it is concerned with generating learning experiences, creativity to build knowledge and ability to know how to access sources of information on diverse subjects". (Assmann, 1996: 21) Education needs to generate experiences and not only obtain ready-made knowledge. A pedagogical principle that does not consider brain-mind

functions as a dynamic and complex system will certainly result in the imprisonment of the pupil to narrow-minded and reductionist visions on reality. As a consequence he/she will certainly lack cognitive creativity and adaptive capacity during his/her lifetime. Therefore, "school education has the singular task of creating conditions to bloom and interlace, in people's concrete lives, the corporal nexus, the languages and behaviors, so that it may constitute in a cognitive ecology beneficial to unified self-organization of the vital processes and cognitive processes" (Assmann, 1996: 34)

"Without affectionate coziness the brain cannot reach its climax in the adventure of knowledge."

(Leontiev, quoted by Hugo Assmann)

I. THE PROBLEM AND ITS DELIMITATION

Among youngsters and adolescents INTERNET has become a "bad habit" so deep that some of them do not have friends in person, thereby losing the capacity of dialogue communication, of establishing relations, and even dating. The ability of manual writing has already become a thing of the past among them. The machine's presence has become an essential condition of life. The preoccupations on this kind of behavior are justified in view of the effects deriving from not only in what refers to concrete participation of people in society but also with what has been discussed and visualized as the needs and possibilities of men of the Third Millenium. In fact, what studies foresee for the next century is that life will be extremely dynamic and pluralist, however, at the same time, considering men in their complexity, taking into account the interlacing of living processes (experiences) with cognitive processes.

Based on these considerations, the research intends to study the interference of the use of the "INTERNET" in the education adolescents of 14 to 18 years of age.

The study is developed in two schools, both located in the Pilot Plan, in the city of Brasilia, Federal District, one being public and the other private.

The public school is the Educational Center of the North Wing - CEAN, and the private school is the Educational Center of Leornardo da Vinci.

Pupils of the secondary grades who possess computers in their homes participate as interviewees from both schools. Teachers and parents of these pupils also participate.

II. OBJECTIVE

The study, in general terms, searches to demonstrate the implications of the "INTERNET" in the young adolescents' education.

The study intends, in particular, to identify in the adolescent "INTERNET" users:

- Behavioral characteristics in the family;
- Attitudes and abilities, most frequently, presented in the development of curriculum activities;
- Manifested types of learning;
- Possible contributions of "INTERNET" use in the development of citizenship, in particular its concepts in regards to participation, solidarity, tolerance, autonomy, justice, dialogue communication, respect of people and socialization in general;
- Results of formal learning of pupils that are users and non-users.

III. METHODOLOGICAL PROCEDURES

The study, which has an exploratory characteristic, uses as data collection, documentary analysis, questionnaires and interviews.

As document, the academic transcript of the pupil is analysed in order to obtain information that will enable a comparison of the results obtained among pupils users and those who are non-users of the "INTERNET".

The questionnaires are assigned to pupils that possess computer in their homes. The interviews are carried out, adhering to a schedule, with teachers and parents of selected pupils.

IV. EXPECTED RESULTS

The study is expected to provide insights that will provoke: 1) At School - changes in concepts, up-dating and curriculum paradigm changes; more adequate planning of pedagogical actions and appropriate use of technologies in classrooms; 2) In the Family - information to parents, in order to facilitate the orientation of their children; 3) In the Educational System - curricular reformulations at different levels and educational modalities, in particular of teachers' education courses aimed at the Third Millenium where globilization, cultural diversity and the use of technology will, increasingly and with greater precision, demand from the teacher specific knowledge, attitudes and abilities to work not only with the reality, but also to as recover men's subjectivity, breaking the cartesian dichotomy subject/object in the search for the citizenship education.

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LIFE-CHANGING TEACHER TRAINING EXPERIENCES: AN ETHNOGRAPHIC NARRATIVE STUDY OF NINE ADULT EDUCATORS.

by
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ABSTRACT

Listening to teachers narrate their training stories clarifies what teachers believe to be effective teacher training. Using qualitative research methods, nine adult educators were interviewed seeking to discover their teacher training pathways. Both male and female educators in Jordan and the USA responded. The research sought to clarify the role of life-changing teacher training experiences in the development of educators.

A preliminary list of factors concomitant with life-changing training experiences is presented. The research seems to suggest that giving educators the opportunity to tell their training stories may itself be a method of professional development. Story telling combined with skilled third party debriefing may be a way of extending the instructional impact of old training experiences.

Further research might suggest that teacher-training stories may be a way of promoting home-grown educational renewal within institutional settings. Perhaps teacher-training stories will be important bridges to connect old century and new century educators.

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INTRODUCTION

Turning fifty has begun in me a period of reflection on professional development. As I survey five decades, I am identifying landmarks of personal development. At each landmark, there are a cluster of interrelated experiences. With hindsight, I can see that many of these experiences were life-changing, some of them profoundly influenced my teaching practice. I suppose that others may have similar landmarks of personal and professional development. Out of curiosity, I proposed this research to see if the paths of others towards personal and professional development paralleled mine.

The type of experience I chose to explore was what I named a Life Changing Teacher Training Experience (LCTTE). A LCTTE may be a single or multiple event(s) happening in one day or over a period of time that profoundly affects a person's basic beliefs about teaching. I wanted to see if LCTTEs are common to other teachers. I also wanted to see if recalling these LCTTEs and reflecting on them might generate new personal and professional development. To illustrate, I would like to share one of my LCTTEs and recent new thinking about that experience.

In 1970, I was enrolled in graduate courses in Education at Oakland University in Rochester, Michigan. I was on medical leave from my post as Principal Teacher of the Peace Baptist Primary School in Bermudian Landing, Belize, Central America. I went to the University to get new ideas for teaching in the Creole context of rural Belize. While there, I met Professor Harry Hahn who became my academic advisor. In his classes and in his office, he tutored me in how to become a more effective and creative teacher of reading. His teaching and that of his colleagues helped me see that students learn best when teachers teach well.

Student failure, I learned, is normally the result of the teacher's failure to help the student learn. Instruction, therefore, needed to be individualized as much as possible. When I returned to Belize, my expectations for myself as a teacher and my confidence in being able to achieve my expectations increased.

As I reconsider this LCTTE through the filter of teaching experience since then, I am able to gain new insights into its meaning. I see afresh that creativity in teaching is for the purpose of helping the teacher and the students discover together the best ways to help the students learn. Along with this new insight on the main purpose of creative teaching, comes a confident conviction that this

insight needs to be shared with others. I find myself saying, "I should develop a seminar for teacher colleagues to focus on teacher-student partnerships in creative teaching."

PURPOSE OF THE RESEARCH

The research was designed to identify the frequency of Life Changing Teacher Training Experiences among teachers and their impact. The research also sought to explore how giving teachers the opportunity to narrate their LCTTEs might be a way of generating new growth from the recollection of the past training experiences.

The basic questions that guided the research were: (1) What is your history of teaching? How long have you been teaching? What have you taught? Who have you taught? (2) What teacher training experiences have you had? and (3) Were any of those experiences Life Changing Teacher Training Experiences? Why ? What impact have they had on your teaching?

DEFINITIONS

Formal Education. All curricular related instruction that occurs within a school is called Formal Education (FE).

Life Changing Teacher Training Experience. Single or multiple event(s) happening in one day or over a period of time that profoundly affect(s) a person's basic beliefs about teaching and that impacts teaching practice constitutes a Life Changing Teacher Training Experience (LCTTE).

Nonformal Education. Typically, Nonformal Education (NFE) is delivered to students outside of formal schooling structures. NFE experiences may be intentionally educational or an educational by-product of a situation.

Teacher-in-Service. Skill enhancing seminars conducted for teachers by teachers during the school year are often called Teacher-in-Service workshops (TIS).

METHODOLOGY

The researcher used an interview approach to collect data. All but one interview was conducted in the home or work place of the interviewee. (The single exception to this was the one conducted on an airplane flying from Amman to Chicago.) Every attempt was made to make the interviewee feel relaxed. Interviews conducted in Amman were pre-planned appointments. In most cases, the interviewees knew the basic questions I would be asking in advance. Each interview began with a degree of interviewee uneasiness. Their

anxieties were quickly forgotten, however, as they began to talk about their teaching experiences.

Each of the teachers seemed to enjoy the opportunity to talk about their teacher training experiences. They seemed pleased that a colleague was taking a research interest in them. The researcher observed that the teachers felt the questions being asked were important and needed thorough responses. In some interviews, the teachers seemed to feel affirmed simply by telling their training stories. Each interview concluded with a summary by the researcher of what he had learned about the person and their training experiences which each interviewee was requested to correct or amplify.

For the purposes of data analysis, some of the techniques used are explained in Participant Observation by James P. Spradley (Spradley 1980). The field research and research reporting sought to implement principles and values discussed in Ethnography Step By Step (Fetterman 1989).

SAMPLE

The geographic context for most of the research (the only exception being the plane trip interview) was the western section of Amman, Jordan, known as West Amman. Interviewees were middle class educators from a mixture of national backgrounds. The sample was not intended to be a representative sample of teachers in Jordan.

Interviewees

The names of the interviewees have been changed to protect their identities. Most of them were known by the researcher for at least one year. A short description of each follows.

Alia is the headmistress of a small English language private school for foreigners. She oversees curricular decisions for each grade and teaches grades three and four. She is an American married to a Jordanian industrialist and has three sons. She earned her Bachelor's degree and teacher certification in 1986 at the University of Wisconsin campus in the USA.

Rolly is a primary school teacher from England. His Bachelor's degree is in Mathematics. He completed his teacher education at the University of Leicester. He prefers to teach the lower primary grades. He and his wife are both teachers and have three children.

Henry is a South African diplomat with a love for geography. His specialty is Biblical geography. As an educator, he teaches religious education classes in community churches. He and his wife have two teenage children.

Samia is an English teacher in a private school in Amman. Her students are fifth and sixth grade boys. Samia is Jordanian and graduated from the American University of Beirut with specialties in English and Education in 1975. She and her husband have two sons.

Nader is Jordanian and works as a high school administrator and as a chemistry teacher. He graduated from a university in Basra, Iraq, in about 1986. He has studied Educational Administration at the University of Jordan. He is unmarried.

Farah is Jordanian and teaches foreign adults who wish to learn spoken and written Arabic. She is a Pharmacy graduate of the American University of Beirut. She and her husband have four children.

Ruth is Jordanian and a primary grades principal of a large K-12 private school in Amman. She has taught school since high school graduation in 1970. Through special government programs she has completed her Bachelor's degree in Arabic.

Rose is Jordaninan and studied Business after high school. She worked as an Executive Secretary for many years. Since high school, she has written musical dramas for her church community. She has been teaching Kindergarten music, either part time or full time, since 1985 in a private K-12 girls school in Amman. She and her husband have four adult children.

Yaz is a financial investment counselor and community educator living in Metropolitan Chicago in Illinois. He is a graduate of the University of Illinois. He is a naturalized American citizen with a Jordanian background. He volunteers his time to teach young Arab immigrants how to succeed in business in the American context. He is married and has several children.

LIMITATIONS OF THE RESEARCH

The research was conducted among only nine community educators and, therefore, cannot be conceived as broad-based. Furthermore, the interviewees were primarily selected on the basis of their convenient proximity to the researcher. The researcher realized that this investigation was a preliminary test of the frequency of LCTTEs and their impact on teachers. Should the results of the research reveal a high frequency of LCTTEs, further research with a more representative sample of teachers would be warranted. While some conclusions are drawn from the data throughout this paper, the conclusions should only be regarded as tentative.

SIGNIFICANCE OF THE RESEARCH

At the beginning of the research, it was hoped that the evidence would show that LCTTEs are components of personal and professional development among teachers. It was further hoped that if LCTTEs were periodically experienced by teachers, the recollection of the experience would generate teacher self-development. It was hoped teachers could turn these powerful memories into low budget but high impact teacher training experiences for others.

As the research proceeded, it became clear that each teacher had had at least one LCTTE and some many more. Some new appreciations of their experiences seemed to emerge. Further study on how to help teachers self-affirm and receive affirmation from others by telling their LCTTE stories may be a helpful focus for follow-up studies.

RESEARCH BIAS

During the first interview, I discovered that I was bringing a bias to the research. In my mind, I had limited the place and time of substantive teacher training to post secondary school studies and to Teacher-in-Services (TIS) after university graduation . I was confining teacher training to post secondary Formal Education settings. I had to change this orientation when I realized that some of the teachers had been involved as Formal Education teacher aides and teachers while in high school and immediately after completing their secondary education. This led me to include LCTTEs occuring in the teenage years.

RESEARCH FINDINGS

The report of the findings is organized around four questions - Do LCTTEs happen to teachers? When do they happen? Where do LCTTEs happen? What is an LCTTE's impact?

Do LCTTEs Happen To Teachers?

Nine community and school educators were interviewed in order to answer this question. Each educator was asked to share his or her teaching experience from as early as their teen years through to the present. Among their many teaching memories, some experiences emerged as clearly more influential in their development as teachers than others. These they designated as LCTTEs, training experiences that changed their beliefs about teaching and that altered their teaching practices. There were other experiences that I observed had also shaped their teaching beliefs and practices. These I have designated as Life Shaping Teacher Training Experiences (LSTTE) to distinguish between my assessment and theirs.

When Do LCTTEs Happen?

As teachers told their teacher histories, it became clear that LCTTEs are experienced throughout life. Their LCTTEs occurred during: High School Years, Post Secondary School, Classroom Teaching, Teacher-in-Service Workshops, and Life Experiences.

Table 1 indicates the occurrences of LCTTEEs in the experiences of the nine teachers according to the five time periods. It indicates whether the LCETTE occurred in a Formal or Nonformal Education environment. Following Table 1, illustrations taken from the interviews will be given for each time period. LSTTEs have been designated by an asterix (*).

Table 1. An Inventory of LCTTEs Among Interviewees

Time Period	Secondary School Age	Post Secondary School	Classroom Teaching	Teacher-in-Service Workshop	Life Experience
Alia	*NFE Teaching Suzuki Method Violin	FE Internship & Nature Center	NFE Classroom discipline in new culture		*NFE ADD lecture
Rolly			NFE Colleague Affirmation	*FE Math Techniques	
Henry	FE Geography Class & new faith		*NFE Pupils resist learning even with strong discipline		NFE Adults learn eagerly with no punitive measures
Samila	*FE Teacher NFE Teacher Aid	FE Observations in teacher education	NFE Choosing to resign due to poor schol management		*NFE Learning faithfulness doing Logos ship duties
Nader	*FE Honesty in leadership	FE & NFE Exemplary teaching & war zone life	NFE Mentor help in school management		NFE Unfair army treatment & Logos duties
Farah	FE Teaching Arabic		*FE Pupil teacher at age 18		NFE Affirming value beliefs
Rose	NFE Song & Story teaching		NFE Substitute piano player for chapel Appointed as Music teacher for KG	*FE Seven workshops for music teachers	NFE Writing drama Guiding a girls club, directing music camp
Ruth	*NFE Registration for training in Ramallah	FE Job tasks & B.A. degree studies at 40	NFE Chosen to be principal of a new school	*FE Initial post secondary education	
Yaz					NFE Job layout & Unjust pay

85?

High School Age Occurences of LCTTEs

Jordan is a mosaic of tribes, clans and ethnic groups. The motto of the country is "God, the King and the Nation". Citizens live, work and practice their respective religions, whether Muslim or Christian, in freedom. The interviewees resident in Jordan all came from Christian backgrounds. Their responses repeatedly mention lessons learned and opportunities received in the context of the religious education program of their churches.

Samia, Farah, Rose, and Nader referred to LCTTEs that occurred to them, while teaching children and learning about teaching children, in the context of their church. The three women attended the same church in Amman. The one man, Nader, attended church in a small market town in Northern Jordan.

In the church, a kind of altruism supersedes clan obligations. Values inculcated in the religous community often penetrate to the deepest center of an individual's beliefs. All three women reported that their Sunday School teaching, story telling, song leading and drama producing were critical to their development as teachers. This training for each of them occurred between the ages of thirteen and eighteen.

Samia recalled the impact her teachers had on her beliefs about teaching. She said that these teachers helped her recognize that if you were going to teach, you had to be committed to doing the job right and at the same time love the children. Samia learned to teach using flannel board story scenes and characters.

Table 2. Recollections of Teacher Training Experiences

Name	How They Taught	Impact
Mrs. Jones	Smiling always	Students relaxed and ready to learn
Mrs. Robinson	With seriousness and a committment to doing it right	Important to have everything arranged for teaching in advance. Respect for the teacher and for ourselves
Miss Hope	Concentrated on us and on our needs	Felt like we had a big sister with whom we could talk,who loved and cared for us

When Rose was in ninth grade (in the 1960s), she became a teacher's aid in Sunday School. Mrs. Robinson and Mrs. Laserton were her main teachers and coaches. She remembered that Mrs. Laserton had the ability to "tell a story to explain a concept." The story served to "give a background setting for the concept." Mrs. Robinson, she said, "introduced drama to me." She recalled Mrs. Robinson telling a dramatic story in Arabic where she changed the tone

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of her voice for emphasis and expression as she told a story about a star. She also learned from Mrs. Robinson, "lots of children's songs." During her late teen years, Rose moved with her family to Damascus. She said, "For five years in Damascus, I copied Mrs. Robinson's methods."

Nader recalled with special clarity the leader of his church's youth group. The quality that entered into Nader's beliefs about teaching was the importance of honesty in teaching. Nader said his teacher, "was a man of prayer, and he was an honest man. He did what he said he was going to do. Whatever he said as a teacher that we should do, he would go for it himself. He gave me a deep inside belief that I needed to be honest with what I taught. I have to be honest, to do what I say."

The research revealed that many of the teachers interivewed began their primary school teaching as teenagers. Beginning teachers in Jordan in the 1960s frequently began their teaching careers as high school graduates. Much of their training for teaching came from pre-high school graduation teacher training experiences in their communities and to a lesser extent in their schools. Additional training came on the job in school-based training programs.

Farah, who later went on to complete her Pharmacy degree at the American University of Beirut, assessed high school diplomas in Jordan in the 1950s and 60s as a "very high standard, like a Bachelor's degree." Farah recounted her experiences as a 17 year old primary school teacher.

"I taught at the Nazarene Primary School immediately after high school graduation. I had a class of twelve boys. I taught third, fourth and fifth grade Science, English and Mathematics. I found teaching to be a nice experience. It was important to treat each child as special. You had to try to make the lessons work for each child. You could not compare one child to another. You had to help each child. While I had to teach the same subject from class to class, I found it fun. I never found it boring. In those days there was a lot of support in the community for teaching."

At the K-12 school that *Samia* attended, she received the opportunity to teach when she was still a student. During her ninth grade year, one of the teaching nuns asked her to teach Bible stories using flannelgraph materials to the lower grades. During that year, Samia did this for several months.

Ruth, who has been a primary school principal for eighteen years, explained that she began teaching immediately after high school. She commented, "I loved teaching." She taught in a private school owned by a

friend. Ruth taught sixth grade boys and girls in Social Studies and Arabic. "My principal taught me how to communicate information to children."

Seven of the nine teachers interviewed indicated that during their high school years they experienced a LCTTE. The teenage years of high school seemed to have a noticeable impact on the teachers' development as teachers.

LCTTEs Experienced During Postsecondary School

Alia studied to be a teacher at the University of Wisconsin in the United States. She characterized herself as someone who liked teaching because, "I always had a knack for getting things across. It seemed like I would always be in teaching." With this knack, she taught Suzuki Violin in high school and taught crafts to generate income when she was in university. By the time her university studies concluded, she had had many teaching experiences: English classes to college age foreign students, second grade in the public schools, French to high school students and community classes at the YWCA.

One LCTTE occurred out of a negative situation she encountered. Working as an intern teacher in her senior year, she failed in keeping the children under control. Alia said, "Failing miserably in the area of discipline was the best thing that could have happened to me, because it forced me to focus on learning how to do discipline". At that time, her advisor, Dr. Fields, pointed out, "You may have the best lessons but if you cannot get the students to sit and participate, it's worth absolutely nothing." Alia focused during that semester of teaching on creating order and discipline in the classroom.

A second LCTTE occurred while taking a field trip as part of a Science Methods class taught by Dr. Fields. Alia indicated that she finds learning within the four walls of a classroom not very exciting. She likes to "get outside and breathe the fresh air." When she had the opportunity to go on the field trip, she was excited. She admitted that she had "an inclination toward science."

She remembered with fondness the field trip and the teaching that occurred that day. Early in the morning the day of the field trip, university buses took the students to the State Nature Center some eight miles from the campus. At about eight o'clock in the morning, the Nature Center Rangers began talking to the students about the importance of teaching nature conservation in the schools and using hands-on science.

To demonstrate what they meant by hands-on science, they divided the students into small groups and rotated the groups through Ranger led learning activities designed for children.

The Ranger taught the students as if they were children and then explained to the students the techniques they had used to teach the lesson. Some of the hands-on learning activities were:

(1) get to know a tree by studying a log, (2) observing bird beaks to see how they are like tools for opening certain kinds of food, (3) handling feathers, (4) Identifying animal tracks, and (5) studying pond mud to see the cycle of life in a pond's ecosystem. During the day, the Rangers gave each student a notebook full of hands-on science lesson plans for use in the classroom.

During the lunch break, the Rangers gave the students the opportunity to ask in-depth questions about what they had been learning on the field trip.

Alia said that this single field trip was for her a LCTTE. "It made me look at all my teaching areas inductively and with an attitude towards discovery. It showed me that I need to let the children discover and make their own logical inductions and conclusions from their discoveries." The teacher's job was to "affirm the students in their discovery experiences." She believes that her teaching encourages the students to learn through discovery and inductive methods.

As we talked about that experience, I asked her to share what she thought was important about science. It seemed as if she was doing some new thinking as she responded. She said, "I see science as key to life." She explained that, for her, science is also the "key to religion and the key to worship as you unlock the amazing and awesome things of the universe" through studying science. She sees science as a "key to relationship with God." She is fascinated by the "dramatic chemistry of tadpole to frog". Science encourages "discovery, wonder, and hands-on observing" in order to discover "relationships to practical life."

Samia believed that her teaching was substantially affected as a result of a series of field trips that she took to schools in Beirut while in her Education studies at the American University of Beirut. She remembered the field trips as opportunities to: "see an actual course being taught in grades one to four where the teacher was able to maintain order and balance." She remembers observing "team teaching, watching how the teachers organized their questions, how the teachers led learning games, organized their materials and moved from one point to another."

Formal Education opportunities in postsecondary studies provide excellent environments for teacher training. Four of the teachers reported that LCTTEs happened to them during their Postsecondary school studies.

Classroom Teaching LCTTEs

When *Henry* was in high school, he determined that he would be a geography teacher. Shortly before entering university, he found a living faith in God. He changed his university majors to Geography and Religous Studies. His first teaching post was in an all-white apartheid era South African private school for boys. Henry discovered that the boys in his class "resisted learning and required a heavy handed approach to discipline in the classroom." He discovered that more energy was put into maintaining classroom "order than in teaching content." After three years of teaching, these realizations caused him to withdraw from teaching high school age children. It was not because he had failed, but because he simply did not want to have to be a "policeman and a judge and a jailer" in order to coerce students into learning. The LCTTE for Henry led out of teaching children into teaching adults.

Alia had learned how to maintain discipline and order in the classroom during her teaching internship in university. With confidence she came to teach in a school in Jordan. Her first year of teaching in an Arabic system was disappointing to her. She recalled that, "Sometimes, I screamed and lost my temper." In the second year ,"I developed a system in which I did not have to raise my voice. It was the old behavior modification approach of rewarding the good and ignoring or trying to quickly axe the bad."

"I put the kids in rows. I learned Arabic quickly. I wrote what was needed on the board. Young children are eager to please. The first row to get everything on their desk and be quiet was rewarded. The children would scuffle with each other in order to be ready first. I gave up on group learning and went to whole class instruction. If a student misbehaved during the day, he got his name written on the back board. If his name was there, he could not play the leaving game. This was a game that I played during the last five minutes of the day. It was a learning game, too. The children tried to keep themselves in order so that they could play the leaving game. I changed the direction of responsibility for student good behavior from me to them."

Samia had a LCTTE in the classroom at age forty-two that had its origin in the board room of the school. She and many other teachers struggled for several years with the changing winds of educational administration, with principals and vice principals and board members who could not agree on appropriate student behaviors and school discipline. She realized after nine years of teaching at that school that its administration did not have the will to make the necessary changes. She concluded that her belief system about

teaching required the board and the administration to work through the teachers to the students, if the ultimate needs of the students are to be met. When this principle clarified, Samia resigned and moved to a school that shared her belief of board and administration working through the teachers to accomplish student learning goals. LCTTEs sometimes serve to clarify non-negotiable beliefs.

Rolly had been teaching primary school in England for fourteen years. He had taught for nine years in an innovative grant-in-aid private school, teaching grades 1-3. His most recent employment had been in a government school for four years where he taught grades 5-6. He had resigned from that position and was substitute teaching. He planned to leave England in order to teach at a school for foreigners' children in the Middle East. His substitute teaching took him to the innovative school whose employment he had left four years previously.

In this former school, he observed that programs he had established six or seven years earlier were still going on well. Teachers at the school commented positively on programs he had introduced. This return to his old school helped him see that he could teach grades 1-3 quite well. The substitute teaching experience "helped me focus on where I am happiest", in grades 1-3. Later the same year, during the summer break, Rolly met one of the teachers from the government school. He said to Rolly, "We are still doing what you did last year." Statements of affirmation by colleagues can sometimes lead to a LCTTE. Rolly is teaching grades 1- 2 at his current school and hopes to continue teaching that age group for the immediate future.

Teacher-in-Service Workshop LCTTEs

Teacher-in-Service workshops are designed by educational administrators to enhance teacher skills in providing classroom instruction, discipline and order. Whether a teacher has a secondary education or a postsecondary education, it appears that the workshops can be equally beneficial to all in shaping teacher practices. *Rolly*, a university mathematics major, commented that teaching math to young children is not easy. He mentioned how much he appreciated a workshop that was offered at the first school where he taught. A professor from the Open University was the speaker. He said that children need to put learning into words and not just on to worksheets. The lecturer commented on the importance of the children talking about their math before writing things on paper. Rolly discovered that it would be helpful to set up a mathematics language so that the children could include those words in their

vocabulary. If they could talk about what they were doing, it would enhance their learning of math. The application of this workshop continues to impact Rolly's math teaching.

LCTTEs and Life Experience

For two consecutive summers, after her 11th and 12th grade years in high school, *Farah* had the opportunity to work using her hobby of language learning. She focused on learning English and improving her Arabic. One of those summers she taught Arabic to foreigners at a language school and then took classes herself in the afternoon at an English language center. She discovered how to learn English better by applying the skills she was learning in teaching Arabic. She taught with three other young Jordanian women under the direction of an American principal, Mr. Laserton.

Henry had just begun teaching at the all-boys school in South Africa. At 23 years of age, he was finding the lack of interest in learning among the students very disappointing. He also was perplexed with the severe discipline he had to exercise in the class just to keep class order so that he could teach . Ninety percent of his teaching was Religious Studies and ten percent was Geography.

About the same time, friends had asked him if he would be willing to conduct a Bible study in his parents' home so that older adults could study the Bible informally. He discovered that with this audience, he could teach Religious Studies and Biblical Geography without needing to enforce punitive discipline. The adults were there because they wanted to be there.

The contrast between the experience of teaching adults who were studying by their own choice and teenagers who were studying under compulsion from higher authorities was stark. Those circumstances generated a LCTTE. The adult study, with the affirmation that came from his adult students, helped him recognize that teaching communities of adults was more satisfying to him than teaching groups of high schoolers. Since that experience in the early 1980s, Henry has taught many adult classes.

Yaz was eighteen and had just finished high school in 1960-61. He was living with his brother in Qatar. He got a job in a printing company. At the time, it was about the only printing company in Qatar. He rose quickly in the company. He became manager of the shop floor. It was his job to keep the machines going.

One day, the Qatari owner came to him. Next to him was a Qatari who was about the same age as Yaz. The owner said to Yaz, "You know we like

you". Yaz said that he thought the man was going to give him a promotion. But the owner said, "I want to introduce you to your replacement." "He was releasing me, not promoting me", Yaz recalled. "I was devastated. I asked why? There was no reason other than he was a Qatari, and I was not."

"I cried for an hour. For several weeks thereafter, I was discouraged. Slowly during that time, it dawned on me that the way ahead was not to dwell on the negative and the hurt but to take a positive attitude and try to move forward. Based on my printing business experience, I started a business forms consulting service. I would help businesses develop the customized forms they needed for their businesses. I did this for about five years."

Through this unfortunate incident, Yaz learned how to speak positively about his situation and move on. Now he teaches young Arab people how to succeed in business in the United States with the hope that they will avoid the difficulties he faced.

In the late 1980s, *Rose* had the opportunity to help conduct four week music camps for boys and girls age 8-12 at the YWCA. "The parents did not want grades, so we were free. Freedom makes you creative." Eventually, summer camp became my whole responsibility. In 1993 we did Hansel and Gretel. It was super. Now I use lots of drama in my teaching."

Life experiences generate LCTTEs. When teachers are involved in activities they choose, the likelihood of experiencing life changing knowledge seems to be enhanced. Sometimes, life experiences include seemingly unfortunate circumstances that eventually translate into LCTTEs.

The stories of the nine teachers make it clear that LCTTEs happen throughout the teenage years and into adulthood. To achieve a fuller understanding of these developmental processes, it would be helpful to know where they happened and to retrieve more information from the teachers on what impact the LCTTE has had on them.

Where Do LCTTEs Occur?

The researcher applied the ethnographer's Location-for-Action foumula to the interview data (Spradley 1980, 93). This formula says "X is a place for experiencing Y". In this research "X is a place for experiencing a Life Changing Teacher Training Experience." The nine teachers reported LCTTEs occurring in eleven places: a Nature Center, the classroom, Sunday School, the stage, Arabic language school, a teacher-in-service workshop, music camp, church, a high school, postsecondary school and the ship Logos.

Listing the places where LCTTEs happened clarified that an LCTTE can occur in both Formal Education and Nonformal Education environments. Fourteen of the nineteen LCTTEs took place in NFE environments. This finding seems to indicate that LCTTEs can occur in a broad range of contexts. It suggests the possibility for training in all experiences.

What Is An LCTTE's Impact?

In order to explore the impact of an LCTTE on a teacher, a site mentioned by two teachers was studied. Samia and Nader both highlighted the year of voluntary work they each did on board the ship, Logos, as playing a critical role in their development as teachers. The Logos visits ports around the world to display and sell books and to provide educational seminars to groups that visit the ship while in port. Shipboard volunteers work under the tutelage of trained sailors to maintain the ship while at sea. Personal development classes are held for all the volunteers in and out of port. The year that each of them spent on board as volunteers seems to have had a constructive impact on their teaching. Service on board produced LCTTES for Samia and Nader.

To find the impact of their Logos service the Means-End formula (X is a way to do Y) was applied to the data (Spradley 1980, 93). The formula became "Logos service is a way to Y". Samia and Nader said that Logos service was a way to: develop stability of character, learn about other cultures, develop faithfulness, develop leadership, stretch your communication skills, grow intelllectually , increase English language proficiency, learn about team work, accomplish a common task by working with others, learn to do one's duty and to develop lifelong friends.

The impact of Logos service on their values as adults and as teachers seems to have been quite significant. While the impact of a LCTTE will be different for each person, the ingredients of the experience will be sufficient to effect a change in basic beliefs about teaching and teaching practice.

A secondary purpose of my research was to explore the impact of the recollection of LCTTEs on continuing professional growth. I was looking for new growth in teacher perspectives or in their ability to articulate their vision afresh as a result of telling the stories of their LCTTEs.

Alia gave three characteristics of her teaching: "enthusiastic, intensely interested in the students and the subject" she was teaching and "not particularly organized; I do everything at once." I asked her why she was this way. She gave me what I believe was new information about herself and her

methods. "I hate to bore kids!! My job is to teach. I have to know the kids well enough to know what trips their trigger so that I can help them bring out their best. I need to understand all the information I am teaching in general, and I should be able to integrate it. In my experience, integration is the key to learning success. " I asked her why integration was important. She said, "In my last year of college, all the courses I took and my teaching internship interrelated. It all made sense because of integration."

I shared with her that the information she had given looked like a good basis for creating a Teacher-in-Service workshop. She responded favorably but insisted she would have to delay until she did some other things. It would seem that she would be able to use her LCTTEs in developing workshops on: (1) how children learn (using the Suzuki Violin method as a starting point), (2) discipline and order in the classroom (using the teacher internship and first year in Jordan) and (3) teaching discovery learning (demonstrating hands-on science learning activities).

I found the same willingness on the part of other teachers to use their LCTTEs as a basis for creating Teacher-in-Service training experiences for colleagues. A facilitator could help the teachers interviewed to develop their LCTTEs into a workshop . This educator could guide them to select their topic, to re-think the experience, to develop an outline and to make the physical arrangements. The educator-facilitator would need to learn how to ask teachers questions that would allow them to tell their LCTTE stories. The next step would seem be to learn how to ask the teachers reflective or de-briefing questions that enable the interviewee to learn afresh as he or she answers the questions. The final step would be to provide an affirming environment where the teacher could package the lessons of their LCTTE into a seminar for other teachers. LCTTEs and the teachers who experience them seem to be relatively untapped and underdeveloped resources for providing cutting-edge classroom-based Teacher-in-Service workshops.

FINAL CONCLUSIONS

The evidence seems to indicate that the nine teachers interviewed have experienced Life Changing Teacher Training Experiences throughout their lives. The teachers own stories give ample evidence of the impact these LCTTEs have had on their changed beliefs about teaching which, in turn, have altered some of their teaching practices.

Among the nine teachers interviewed, it appears that LCTTEs are frequently

experienced in NFE settings. It also was clear that combining FE and NFE approaches (as was done aboard the Logos) may promote LCTTEs. The data suggests that both NFE and FE approaches in teacher training should be utilized.

Further, the data seems to indicate that LCTTEs often grow out of trainer to trainee relationships. The trainers demonstrate their commitment to the relationship through honest and kindly communication with the trainees and exemplary modelling of teaching practices. These attitudes and actions create a climate where the trainee is permitted to thrive as a growing learner. Through patience, affirmation and example, the trainer shows that the community believes in the trainee's potential. Dr. Fields, Mrs. Robinson, Mrs Laserton, Mr. Laserton, Miss Hope and Dr. Harry Hahn are examples. The trainee supports the relationship through a commitment to spending time with the trainer in order to learn how to be a better teacher.

LCTTEs also seemed to occur when teacher training focused on acquiring methods that would facilitate maximum learning. When trainer and trainee were partnered together in this common goal, life changing teacher training experiences occurred. Possible examples of this include: the attempts of Dr. Fields, of Alia and of her class in trying to learn the best ways to teach science to children and the Teacher-in-Service workshop on Math Language that revolutionized Rolly's teaching of math.

Some LCTTEs appear to occur when the trainers used a combination of cognitive and affective learning methods. As Samia and Rose aided Mrs. Laserton and Mrs. Robinson, they seemed to have learned how to help children to grasp religious faith with joy, color and clarity.

Other factors that may be pivotal to the occurrence of LCTTEs are listed.

Possible Factors Contributing to the Occurrence of a LCTTE

1. Teacher freedom that supports creativity (Rose's Music Camp)
2. Teacher's hobby interests as the basis for professional growth (Farah's language hobby)
2. Teacher circumstances that threaten self-interest (Samia's resignation, Alia's internship class)
3. Decisions by others that thwart the teacher's goals (Yaz' layoff, Henry's resistant students)
4. Self-interest in developing professional skills (Ruth's Teacher-in-Services)
5. Combinations of FE and NFE in teacher training (Samia and Nader on the Logos)
6. Affirmations of a teacher's instructional skills by other teachers and friends (Rolly's colleagues)
7. Teachers modeling exemplary teaching over time (Rose's Sunday School teachers)
8. Teachers becoming coaches to teacher-trainees (Alia's faculty advisor)

During the interviews, the researcher discovered that there were many

training experiences shared which the interviewees and the researcher did not designate as life changing or life shaping. It might be useful to study some of these lower impact training experiences to see if some of them might be grouped into another category for study.

The research indicates that LCTTEs frequently occur among teachers throughout their lives. Simply the recollection of LCTTE's provides a door for generating new growth from the old experiences. LCTTE stories also offer potential as the basis for Teacher-in-Service workshops. In order for LCTTEs to be used effectively in these ways, more research needs to be done on helping teachers learn to identify and evaluate their LCTTEs and then translate them into new experiences of professional growth for others.

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A CURRICULUM FRAMEWORK FOR VOCATIONAL INDUSTRIAL TEACHER EDUCATION IN TAIWAN

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ABSTRACT

The purpose of this study was to develop a curriculum framework for vocational industrial teacher education in Taiwan. The research methods included literature research and panel discussion to identify the framework of curriculum for vocational industrial teacher education. According to the framework, the instructional objectives were summarized.

The courses under the framework are divided into two catagories: professional technique and pedagogical content knowledge. Professional technique consists of a sequence of courses for the training of specified technique, including basic industrial skills, industrial technique, trade technique, and production technology. Pedagogical content knowledge consists of a sequence of courses for successful teaching in vocational subjects, including general education theories, industrial education theories, instruction of industrial subjects, and teaching practice.

Keywords: curriculum , vocational industrial teacher education

INTRODUCTION

Taiwan's economy has developed rapidly in the recent forty years. The GNP (Gross National Product) raised from $186 in 1952 to $12,872 in 1996, and Taiwan converted from trade deficit into trade surplus. It is the focus of world attention and is regarded as an "economic miracle".

Though there were many factors affecting economic development, the most important of all was the development and exercise of human resources, which could match with the needs of economic developmental stages (Chang, H. T., 1992). The vocational industrial schools provide considerable entry-level technical workforce to meet the demand of trade and industry. Statistics show that, since fiscal year 1993, more than 144,000 students have graduated from vocational industrial high schools each year in Taiwan (Table 1). Such a flood of human resource, indeed, has played an important role in developing Taiwan's economy (Kang, T. L., 1994).

However, the number of teachers was not in proportion to that of students in vocational industrial high schools. Consequently, the question was on how these teachers keep high quality instruction in teaching so many students. Teachers of high quality are needed to cultivate excellent students; the curriculum of teacher education should be improved to cultivate teachers of high quality. It was obvious that the teacher education is very important. Therefore, the purpose of this study was to develop a curriculum framework for vocational industrial teacher education and to cultivate the best teachers for vocational industrial high schools.

Table 1: The Number of Vocational Industrial Education

F.Y.	*Number of Schools*	*Number of Teachers*	*Number of Students*
1993	136	7,680	144,000

Source : Ministry of Education(1994). Education Statistical Yearbook of R.O.C..

There have been many educational programs in the universities for industrial vocational teacher education since the "Action of Teacher Education" was implemented on Feb. 7, 1994 (Ministry of Education, 1996). But the educational theories and specific technique were isolated because the teacher education curriculum has not been integrated (Chang, J. C. & Hsiao, Y. D., 1996). Thus, more effective strategies are urgently needed to assist teacher education students in curriculum design and development.

In addition to the abilities of general education, the teachers of vocational industrial schools need the hands-on experience related to industry (Cho, T. H, 1983), the specific technique of production (Rau, D. C., 1994), and the correct demonstration of working procedure (Hsiao, H. C. & Wei, M. X., 1993). Kang Tze-Li (1989) pointed out the ideal teachers of vocational industrial schools should possess the following 7 competencies: (1) industrial education, (2) interpersonal relation, (3) instructional material planning and evaluation, (4) instruction, (5) knowledge and technique of the specific subjects, (6) maintenance and management of shop and classroom, (7) instructional evaluation.

From the above literature, it can be concluded that the curriculum framework for vocational industrial teacher education should contain at least two parts: professional technique and pedagogical content knowledge.

METHOD

The purpose of this study was to develop a curriculum framework for vocational industrial teacher education in Taiwan. The research methods employed literature research and panel discussion to identify the framework of curriculum for vocational industrial teacher education. From the literature review and a seven expert panel discussion, the two parts, professional technique and pedagogical content knowledge, were also identified.

RESULTS

According to the panel discussion, the goals of the instruction were first proposed to guide vocational industrial teacher education as following:

1). To cultivate technical teachers for vocational industrial high schools and vocational training centers.

2). To improve the curriculum. Instructional materials and methods are based on research and development for vocational industrial high schools in order to meet the needs of the society.

3) To study the trends of industrial development and to prepare engineering technical personnel for business enterprise.

By the above instructional goals, the continuity, sequences, and integration of curriculum, the initial curriculum framework was made. The courses under the framework are divided into two categories and four levels for each category .

A. The professional technique

Professional technique consists of a sequence of courses for the training of specified technique from basic industrial skills to production technology (see Figure 1). As Figure 1 shows, the teacher education students learn specified techniques step by step, and get the abilities of technical research, development, and evaluation.

The professional technique courses include four levels:

1) Basic industrial skills

Basic skills of machine shop, sheet metal, wood working, electrical shop, and welding shop.

2) Industrial technique

Passing the specifical competency tests, the criterion in this test is above "B" of the skill license given by the Council of Central Labor Affairs.

3) Trade technique

Learning specific trade technique and theories are required for students who have passed the specific technical competency test.

4) Production technology

Learning production technology by attending internship for three months.

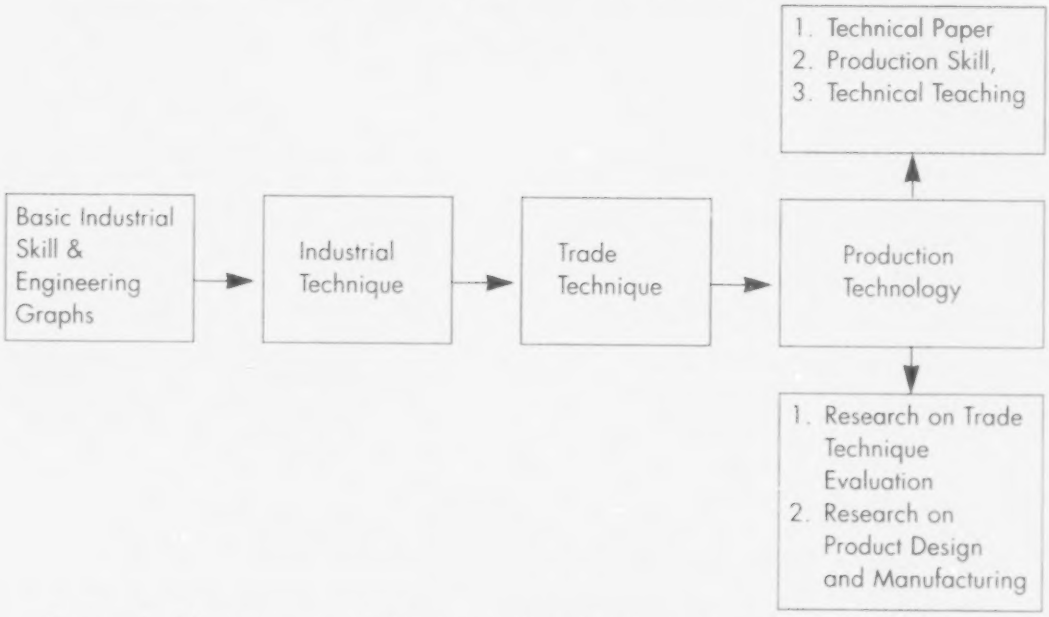

Figure 1. The sequence of the specificed technique courses

B. The pedagogical content knowledge

Pedagogical content knowledge consists of a sequence of courses for successful teaching in vocational subjects from general education theories to teaching practice (see Figure 2). As in Figure 2, the teacher education students take industrial educational courses accordingly to secure the abilities of teaching in vocational industrial schools.

The industrial education courses are similar to professional technique courses including four levels:

1) General education theories

   Including requirements of educational theories for normal university promulgated by the Ministry of Education, in order to learn modern instructional methods.

2) Industrial education theories

   To learn specific knowledge of industrial education.

3) Instruction of industrial subjects

   To prepare special ability for students who are excellent in industrial subjects in vocational industrial schools.

4) Teaching practice

   To fulfill real-world teaching experience in vocational industrial schools.

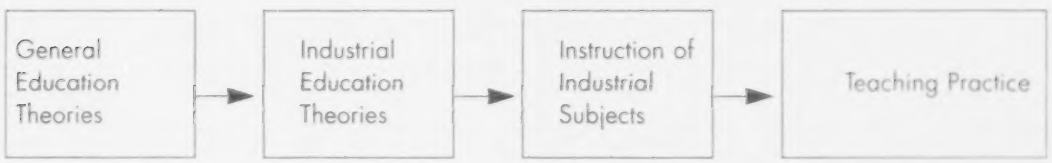

Figure 2. The sequence of the industrial education courses

Figure 3 illustrates the curriculum framework for vocational industrial teacher education is composed of specified technique courses and industrial education courses.

RECOMMENDATIONS

From this study, some recommendations were proposed for vocational industrial teacher education:

1. Enhancing the cooperative education system in higher education brings benifits for both industry and schools. A sound cooperative education system will help teachers hold the excellent specified technique and stimulate organization development of the cooperative enterprise..
2. Establishing the Center for Trade Skill Test Bank in the vocational industrial teacher education institute to combine the specialized technique and theories of education.
3. The future researchers may focus on how to effectively develop different fields in universities for curriculum framework of teacher education.

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Figure 3. A curriculum framework for vocational industrial teacher education

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COLLABORATIVE CURRICULUM DEVELOPMENT INNOVATION: TOWARDS A BETTER USE OF COMMUNICATION TECHNOLOGY

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Current financial constraints, coupled with the poor educational atmosphere conspire against the Palestinian Educational Policy Makers by hindering the development and implementation of new curricula that utilizes information and communication technology.

As a step directed towards preparing teachers for the 21st century, we plan to challenge the current obstacles and remodel one unit of the 9th grade science curricula so that it allows the utilization of the available information and communication technology in Palestine.

Our target group includes three 9th grade science UNRWA teachers and their respective students. Remodeling the unit requires active participation of the teachers during preparation and implementation. As a consequences, teachers will acquire new teaching practices.

We will collaborate with the teachers in preparing working sheets that include open questions in addition to instruction sheets. Students will be guided and advised to use video tapes, interviews, books, journals and other available information sources to answer the questions. They will also be supplied with kits that will help them acquire the technical experience in the relevant device construction. We believe that this strategy will encourage the involved students and prepare them to become independent life long learners, as they will be aware of the various information sources including the Internet.

COLLABORATIVE CURRICULUM DEVELOPMENT INNOVATION: TOWARDS A BETTER USE OF COMMUNICATION TECHNOLOGY

INTRODUCTION

The continuous and rapid development of communication technology is attracting the world's attention. Its numerous advantages can be utilized in almost every aspect of life. In education, the development and implementation of new curricula that utilizes information and communication technology is a recognized path that leads to educational reform. Palestinian educational policy makers aspire to follow this path. However, the current financial crises, coupled with the poor educational atmosphere conspire against its application.

The traditional teacher - centered model of the learning process is still being used in Palestinian schools. In this model, the teacher is viewed as the holder, dispenser and inculcator of information and knowledge. Textbooks are the major (very often the only) source of information. Use of communication technology is very scarce and computer illiteracy among teachers and students dominates.

This pilot study aims at challenging the above obstacles by following the resourse-based learning approach, where the researchers and teachers guide the students and act as facilitator of the learning process. To achieve effective learning, the researchers and the teachers collaborate in 1) structuring the learning environment to ensure that learner outcomes are clear and meaningful to the students, 2) guiding and advising students to access and use information resources which include: texts, audio-visual material, locations, people and technology, 3) providing the necessary skills to help the students to select, evaluate and analyze the resources, 4) assisting the students to present their results in an appropriate format, 5) making plans to assess the research process and product.

Success of this study requires collaboration with teachers who believe that the traditional model is ineffective. They should also express commitment to change their vision and engage in the resource-based learning approach.

PURPOSE

The purpose of this paper is to follow the resource-based learning approach in remodeling one unit of 9th grade physics curriculum so that it allows the

utilization of the available information and communication technology in Palestine. It also allows integration of science and calls for flexible student groupings who will work on projects while constructing the relevant knowledge.

EDUCATIONAL SETTING

In 1992, the Palestinian Ministry of Education (PMOE) replaced the Israeli Civil Administration in the field of education. Since then, the (PMOE) has been challenged to develop its inheritance of unhealthy, and poor quality educational system and atmosphere. In fact, Palestinian policy makers, teachers, pupils and parents have been calling for educational reform that includes the development of staff, curricula, instructional methods and teaching resources.

Better use of information and communication technology is recognized as a priority that will lead to a faster reform. Communication technology was introduced to Palestine in 1994. Workshops and short-term training courses on Telematics (which included E-mail and Internet) were implemented. In November, 1995 the first Palestinian Academic Network -PLANET- (www.planet.edu) was established. Since then six more commercial networks have been established, with PALNET (ww.palnet.com.) being the most popular. The number of Internet users in Palestine increased from a few hundred in 1995 to 2500 in 1997. Currently, seventy institutions have sites on the Internet. Among these are five universities. At school level, the Internet does not exsist. In fact, most of the schools do not have computers or telephone lines. Universities as well as other institutions use radio modem to access the Internet. Local Area Networks (LAN) only exist within the same university. Universities, libraries and institutions are not yet interconnected.

PREPARATION FOR SCHOOL REFORM

The need for educational reform was first implemented by UNRWA Field Education Department, West Bank. The three units of the department namely, Education Development Centre, (EDC), Educational Science Faculty (ESF), and Practice Schools met during the summer of 1996 and decided to work in a complementary manner to facilitate and promote educational reform by amending the practice teaching program and staff development procedures. An important amendment was the decision of assigning two schools as professional developmental schools. These schools are to be considered as (Gartner, 1995):-

a) laboratory schools for ESF research, where pilot/case studies are performed

b) demonstration sites for the display of good teaching

c) practice teaching sites

METHODOLOGY

A) The Working Team/Qualitative Data

This research commenced in June 1997. The first set of results were completed in November 1997. The team worked in a condensed manner on a daily basis. All parties involved were: ESF of Ramallah Women's Training Centre (RWTC), EDC, Ramallah Basic School (RBS) and Kalandia Basic School (KBS) are components of UNRWA Field Education Department/West Bank. Research work was characterized by a high level of coordination between the four parties and the administrative team comprised of Dean/ESF, Principals/RBS and KBS, and Head EDC with special emphasis on commitment to educational reform.

One of the researchers is the Dean of ESF who is an electrochemist, the other is a faculty instructor of physics/education at ESF and the three science school teachers teach at RBS and KBS. This composition fulfills all the necessary elements required to initiate an effective reform: An administrator, a university teacher, (as a supervisor), science teachers (in-service trainees seeking professional development) and pupils (where learning outcomes are assessed and verified).

Formal interviews with the selected teachers revealed that they:-

1. differ in age and experience.
2. hold similar epistemological beliefs that views the teacher as the central part of the learning process.
3. share similar experiences in professional development based on attending workshops, seminars and classes which are conducted in a traditional way.
4. have some knowledge regarding integrated or interdisciplinary curricula.
5. admit that quality of education is deteriorating, and are aware of the need for educational reform.
6. are ready, enthusiastic and willing to try new practices.
7. are competent in their field.
8. know how to use a computer.
9. have knowledge about education technology.
10. have never used E-mail or Internet.

The unit chosen for remodeling is electricity with special emphasis on cells. This unit is part of the 9th grade physics textbook. The current content of the unit (as well as the rest of the units) is presented in a rigid, abstract, discrete and rather difficult language. Consequently even the electrochemist faced difficulty in engaging with the material. Naturally, students do not understand it and develop hatred of physics in general. As a result, Palestinian students (in 10th grade) lose interest in science and pursue liberal arts because they believe that they cannot understand physics.

Regarding *information and communication* technology resources, both schools:

1. have good laboratories. However the labs lack the required tools, pieces of equipment, and instrumentation.
2. have libraries with limited number of books, journals, and video-cassettes.
3. do not have computers, hence no access to the Internet.
4. have a VCR
5. do not have over-head or slide projectors.

LIMITATIONS:

1. The currently applied traditional model of learning is different in philosophy and objectives from the adopted resource-based learning approach. This necessitated extra time and effort for planning and remodeling the unit. Additional time was also spent on the development and psychological adjustment of all members of the team.
2. The teacher's heavy load, closely packed school schedule, crowded class-rooms and school environment that enforces students' discipline (Brandt, 1991), and strict adherence to school text-books.
3. Teachers' beliefs (Hashweh, 1996, and Gallagher, 1991) and attitudes towards teaching.
4. Teachers lacked the skills and knowledge of using the Internet and preparing worksheets.
5. Lack of computers and access to the Internet in schools.

APPROACH

The traditional model of learning views the teacher as the holder and dispenser of knowledge, and the learner as the receiver. The learner and content are separate and fixed entities, a successful teacher is in control and

manages the curriculum, runs activities and disciplines students. He or she controls the method of delivery of content and the time allotted for the subject matter.

The resource-based learning which utilizes the project approach offers a way of transferring the responsibility and control for learning over to the students while maintaining the advantages of the teacher's knowledge and skills. Working in flexible student groupings allows the students to learn to plan, gather information, engage with subject matter, construct and present the outcomes collaboratively. It also allows integration of science. Consequently, the constructed knowledge is less likely to remain internt (Ravenwitz,1993), and the students are prepared to become independent life long learners.

RESEARCH PROGRESS

It is important to point out that during all stages of research:-

1. each member of the team was involved in recording her comments, feelings, findings, recommendations... etc.
2. members of the team met regularly and frequently.
3. all relevant accessible resources such as books, journals, audio visual material, people and technology were used.
4. data were collected from recorded formal interviews, questionnaires, video tapes etc...
5. RBS and KBS principals provided the necessary support to all members of the team. They provided flexible teaching schedules to involved teachers and allowed them to practice the new teaching methods without interference.

RESEARCH PROGRESS

Phase 1: Choosing the unit and selecting teachers

1. The research decided to remodel the electricity unit mainly because they are specialized in the subject matter and students find it very difficult to understand.
2. Science teachers were selected from the training schools (where ESF pre-service trainees carry out the practice teaching requirement). Formal interviews and questionnaires completed by the selected teachers provided information regarding their ages, experience, skills, competencies, beliefs and readiness to be involved in the resource-based method.

Phase 2: Remodeling the unit. All members of the team participated in this phase which took three months to complete.

1. The electricity unit in the 9th grade physics textbook was carefully studied and analyzed: Objectives, concepts, methods of teaching, ... etc were reviewed.
2. A brainstorming session regarding the philosophy of student-centered learning approach lead to setting new objectives, content standards, new ways of introducing concepts and constructing knowledge.
3. During the regular and frequent meetings, members of the team collaborated in:-
    1. choosing four projects that represent the subject matter of the unit. Projects were to be completed by the 9th grade students who should work in flexible groups and on a rotational basis.
    2. choosing the appropriate activities that fulfill the objects of the constructive approach. Accordingly, worksheets were prepared. They included questions, tasks, assessments and rubrics.
    3. designing and constructing worksheets relevant to the activities. Format and content of worksheets were based on information and instructions gathered through:
        a) Internet
        b) E-mail
        c) Published articles
        d) Teams' knowledge and experience
        e) Consulting colleagues
    4. building specialized, small libraries inside the school laboratories. The library included all relevant textbooks, journals, video-cassettes, laboratory manuals, print-outs, instruction sheets and worksheets.
    5. Accessing all tools, pieces of equipment, chemicals, and instrumentation. ESF provided the schools with most of the required items.

Phase 3: implementation

1. Each teacher divided her class into groups of 8 trainees. Each group included trainees with different competencies, and leadership qualities. All

projects were completed by each group and on a rotational basis. Members of different groups were encouraged to share, exchange and discuss information, knowledge, results... etc.

2. The teacher and at least one researcher played the role of guides to the trainees. When required, they offered help, provided skills, and raised helpful questions and assisted trainees to evaluate their progress and reflect on what they were learning. Their presence was also to ensure the implementation of safety rules and regulations.
3. Trainees depended on themselves in gathering and using the proper information, building devices, running experiments, completing working sheets, analyzing, reflecting, evaluating, and presenting their results in a collaborative approach.
4. A workshop that included: all 9th grade science teachers in Ramallah/Jerusalem area (20 teachers), all science supervisors, the working team and KBS 9th grade students was held at KBS. The agenda of the workshop included:
    1. a theoretical discussion and comparison between the teacher centered (resource-based) approach and the traditional (student-center of approach).
    2. explanation and description of means and stages of development of the electricity unit and
    3. attendance and participation (supervisors were observing and also playing the role of guides) during the implementation of one laboratory sessions.
    4. collecting all participants comments.

Phase 4: Assessment

Assessment was an ongoing process though out all phases of planning and implementation of the unit's remodeling. During planning, researchers and teachers were involved in the assessment process. During the implementation phase, researcher teachers, supervisors and students participated in assessment. Both the content, learning process and outcomes were subject to assessment. Means of assessment included frequent meetings, discussions, reflection, expressing feelings, recording progress, commenting, amending, creating logs, index cards, summarizing etc... Students were guided and encouraged to assess what they were learning.

Final assessment took place after grading students' reports, and presentations.

EVALUATION:

Prior to remodeling the unit, questionnaires completed by:-

A) teachers revealed that they adopted the philosophy, applied methods of teaching and held beliefs that were coherent with the traditional model.

B) students regarding their teacher's methods of teaching, practices and attitudes revealed the following:-

1) teachers did not play a role in developing the students' personalities - as no interaction and relationship existed between both.

2) subject matter was presented in a discrete manner; no interaction between other subject matters or environment existed.

3) methods of teaching reinforced spoon-feeding and memorizing.

4) concepts were not presented in a clear manner, hence remained vague.

5) interaction among the students and the concept of teamwork and collaboration did not exist.

6) students did not like sciences and found it hard and boring.

After remodeling and implementing the unit, forms completed by teachers and students revealed that:

a) teachers started to doubt the traditional approach favoring the constructivist's.

b) students agreed that they passed through "a wonderful" experience as:-

1) love for research and discovery were developed.

2) self-dependency on utilizing resource information was practiced and felt.

3) ability to integrate sciences was developed and appreciated.

4) Capabilities to discuss, analyze, argue, exchange views, build-up ideas starting from concrete to abstract were developed.

5) collaboration, cooperation and teamwork were experienced and enjoyed.

6) leadership qualities were discovered and increased.

7) self-confidence was built. The reward gained from self learning was valued.

8) classes were enjoyed, "time passed very quickly".

9) sense of appreciation and love for science was enjoyed. However, the following "negative" points were raised by both teachers and students:-

   1) Completing the worksheets was a difficult task. It required a lot of time and effort.

   2) Students encountered some difficult problems and were puzzled about correct answers. They were frustrated as they did not "find the answers in books..."

   3) students were worried all the time and obsessed by the projects.

   4) time allotted for completing the projects seemed to be insufficient.

CONCLUSION

The electricity unit of the ninth grade physics textbook was remodeled in a manner to utilize information technology including the Internet.

All available information resources, "although simple" were made accessible to students. They were utilized while the students were involved in implementing the remodeled unit.

Assessment and evaluation of applying the resource-based learning approach changed the attitudes of both the teachers and students towards science. Teachers began to believe in the constructivist approach, while students - who experienced it - began to act as real scientists. Even the "negative" points they mentioned are characteristics of scientists. Actually the students began to experience the thrill of becoming life long learners.

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THE RELEVANCE OF A THEORETICAL BASIS FOR A TEACHER EDUCATION MODEL: A CONTRIBUTION TO COMTEMPORARY TEACHER EDUCATION DEBATE

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1. Introduction

In contemporary educational environment new challenges demand prompt and adequate answers. It is assumed that the particular question of teacher education identifies with quality and excellence in education and its reconceptualisation is an absolutely essential condition if school systems are to be increased in order to respond effectively to problems posed by the needs of the globalised, inclusive and post modern world, we live in presently.

The scope and diversity of the changes in the world scenario that have occurred since the early 80s have affected social representations of democratic citizenship. The question of what education for what citizenship is posed and teacher education has to be designed in prompt response to a wide range of social and political pressures.

The forty-fifth session of the International Conference on Education (ICE) that took place in September 1996 was devoted to the discussion of strengthening the role of teachers, a theme that was selected not only because of the contemporary concern on the subject but mainly due to the key role played by teachers in confronting the challenges of the future. A fundamental aspect, among others identified in regional discussions, is that more is to be expected from teachers: they will be appreciated not only for their knowledge and technical skills, but also for personal qualities that will be increasingly considered as an indispensable requirement (Tedesco: 1996).

The social role and technical competence of the teacher and the focus on the presupposition of the relationship between educational action and citizenship among other main points stand out to perform a reconceptualisation of teacher education within a present-day context. So, the implementation of reconceptualised models must take into account not only particular strategies, approaches and methods but also the permanent and intensive interaction

between school, its surrounding environment and society to enable institutions to put forward effective and innovative training programs.

On the other hand, teachers' practice raises the question of his/her value system, exposing fragilities and insecurities as far as moral, philosophical and professional competence is concerned, bringing up the question about the meaning education has for a teacher. Taking into account the essential relationship between values and education as a support for the question of creative and critical thought, which is an indispensable tool for innovation, it may be said that one is committed to the values one has adhered to. Such values are universal, absolute and ideal and apprehended from the experience of really valuable situations (Nogueira, 1995).

The proposals to be put forward for a change in teacher education raises the question of how to develop awareness of theoretical principles, which constitutes the framework for pedagogic practice and leads to conceptual and experimental inquiry. However, 'any proposals for reforming teacher education programs, when not supported by theoretical presuppositions nourished by values, are reduced to mere list of strategies and methodological orientations, aiming at the efficiency of the professional practice but leaving behind the substantive question of the postulates of education' (Nogueira: 1996, p. 8).

A commitment to a political engagement with the challenge posed by contemporary society - the information society - is paramount, regardless of how postmodernity thesis is explained (Lyotard: 1984, and Habermas: 1981, endorse opposite interpretations of postmodernity, although not mutually eliciting). Then, it is relevant to focus on the development and consolidation of a range of intellectual and political theories, which shape as well as contribute to cultural (ideology) and political (economy) shifts in industrial societies and highlight the notion of postmodernity.

From this perspective, therefore, the reconceptualisation of teacher education within the contemporary world is to be rooted in transition from modernity to postmodernity. This statement expresses an assertion which considers teacher education models that grapple with the media technological revolution, value the differences, celebrate diversity and recognize the need for more thoughtful and committed teachers.

It is also argued that consideration of teachers' political option implies the ways in which individuals actually take up the social/cultural manifestations of postmodernism. Then, teacher education for postmodern contexts is to be

provided with a political and social meaningful curriculum to enhance reflective and creative thought.

The key characteristics of postmodern culture and education within that culture are to be sought in the construction of teacher education proposals, which demand by themselves a theoretical frame. Educational practices, that respond to what is designated postmodern, determine educational innovations and emphasize the incorporation of information and communication technologies (ICTs) into educational systems.

2. Education and globalisation: an awareness about the contemporary challenges

In the 90s, it has become imperative to lead, with greater competence and special attention to the fast time-rush, the effective actions turned to the realization of innovative projects which can guarantee to the educational systems the role of the agent/subject in social cultural processes that are presently universalized and whose dynamics settles in the dialectics between the impact of science and technology in the world of life and our cultures and social relationships. Therefore, it is non-deferrable 'to think in a more rigorous and comprehensive way about the articulation of education with the political system (political and institutional reality) in which that articulation implies the need for social change, the dialogue with reality, the challenge to understand and face the impact of science and technology' (Nogueira: 1993, p. 2).

One cannot deny the historical context of modernity, the fast development of science and its consequence in promoting the realm and application of high complexity technologies in the last decades of the twentieth century. The fundamental discussion is not in resisting to the modernization process of society and economy that is generated by and generator of new industry, consumption and communication profiles but how we shall take part as probable subjects of that process and how to put up our own development.

In the modernity scenario, globalisation plays the role of a dominant trend. It must be understood as a historical and unchangeable phenomenon which happens in the society formation itself, representing a reorganization of the social reproduction spaces. These spaces are being delineated in new hierarchies, involving 'not only globalisation as block formation, fragilization of the State-Nation, the coming forth of subnational spaces split into several ways, the change of the metropolis role, the reinforcement of the cities' role and a gradual reconstruction of community spaces...' (Dowbor: 1996, p. 56).

Taking into account the importance of changes already generated and still being generated, which will be more intense and more accelerated as the information society of information fulfills itself, nations have the necessity to look for alternatives that overcome their social and political organization and create their own transition, paying attention to the contexts of production, citizenship and internationalism. Furthermore, the different development levels, each one with its particularity, which originate from the dynamism of their own surroundings, are creators and creatures of interactions that happen in such contexts.

Such global society therefore implies the interaction between socio-cultural and political standards, as well as the institution of reference systems and values derived from hegemonic centers; that is, an international culture elaborated in a process of world-wide standards, socio-cultural values and cultural products. Thus, modification, integration of standards and incorporation of values which prevail in dominant centers, will occur due to the breaking of cultural frontiers (Ianni, 1996; Dowbor, 1996; Schaff, 1995).

Considering Schaff's supposition that the expansion of supranational culture enriches human personality, leads to a superior level of culture and changes the reference model and the social character of men, one cannot omit the inherent dangers on the process of culture internationalization, that necessarily shelter the social elements of cultural diffused values. Considering the hegemony of societies that dominate information diffusion and that, due to their richness, with-hold better technological knowledge, real dangers of neo-imperialism and cultural neo-colonialism are evidenced (Schaff, 1995, pp 79-81).

Therefore, taking into conscience and reflecting on the changes of society's cultural formation, having in mind the rhythm guiding such changes, conceptual and praxiological challenge submitted to education will then become concrete.

Thinking about the realization of the informatics society's utopia, it is necessary to enquire on the social quality of the utopia being put into practice. This question leads to the following argument: education for what citizenship? We then start off from the contextual factors on which this essay is being prepared.

Globalization creates global society's design, presenting a panorama in which the individual needs to think and to position himself/herself as a citizen of such society. There are new forms and significance of work. Cultural standards and political conscience are changed. Technologies raise challenges

of information without frontiers. Economies, with their transnational character, begin to rule in a more intervening and acute way configurations of power, hegemony and domination. How will education propose to answer to questions that pass through social system? How will it face up to the accelerated rhythm of transformation?

The greatest challenge imposed by globalization is the task to redefine citizenship and institutions. Globalization affects all dimensions of human condition; submitted to education is the challenge of the cultural reconstruction processes, integration, sociability and individuality, of which dynamism reveals itself in the strong oppositions/compositions of elements in permanent mutation.

3. Focusing on the relevance of a theoretical frame: an attempt to consider some key points

Reference was made to the crisis of modern science paradigm. Historically, since the middle of the XIXth century, science has exercised total hegemony in occidental mind, conducting technological development, which it made possible, by its rationality. Today, epistemological reflection unveils outstandingly and evaluates science's social consequences and the sense of the world it structured (Santos: 1995; Schaff; 1995; Kumar: 1997).

Thus, such paradigm, 'having the apogee of science dogmatization in logical positivism' (Santos: 1995, p. 23), began to face the critical challenge of the constitution of two scientific universes, social science and natural science, and its insertion in the present world.

Paradigm of modern science is rooted in the distinctive conception between nature and society; the critical comprehension of such conception identifies its crisis and the presence of a new paradigm in configuration.

Paradigm is an abstract model. According to Kuhn (1962: p.219), 'paradigm is something shared by members of a scientific community and, inversely, a scientific community consists of men who share a paradigm', permitting to notice that such model is subject to a determined period and to a particular scientific community, in which beliefs and values of their own are present.

Should there be a crisis of modernity itself 'as a form of the human reason, as the exercise of the reason itself' (Marques: 1992, p. 556), there will be a paradigmatic transition demanding from education a profound reflection nourished in the radical alteration of knowledge conception. This will construct

itself on the relation between social actors and their pronouncements, in the search of mutual understanding' (ibid, p. 558). What is being discussed nowadays is the 'intelligibility form of reality that a certain paradigm provides and not only the methodological and conceptual instruments giving access to it' (Santos: 1995, p.18).

At this stage of discussion, let us welcome Marques's judgment (1992, p. 549) in which, 'as all human act, educational action needs to, in such a way, make a theme, that is, erect, under an explicit question of reflection and discussion, concealed paradigms and, therefore, needful of re-examination, as a basis to clarification and political praxis'. To re-think its own postulates education faces the reconstruction of reason itself, centered in the pragmatic language of the world of life, that is, 'in the inter-subjectivity of free communication between the social actors' (ibid, p. 557).

The paradigm of subjective reason, which conducted man to create his scientific universe according to the norms of reason itself and permitted reason to ignore its validity in ethical and political criteria, has allowed the flourishment in the educational field (based on the thesis of positivism and functionalism) of the concept of life preparation caused by 'the denial of the complexities of the world of life, of human engagement, of the question of values and of the political question' (ibid, p. 554).

However, teacher education in its curricular propositions has accompanied the school course in modernity, which reproduces the dynamism of the production system, in the intimate relation evidenced between this system, the political system and the educational system. Modern school, progressively consolidated in the XIXth century by the emergence of national educational systems and in the first decades of this century accompanying the industrial revolution, still prevails amidst the present technological and industrial revolution, in which micro-electronic and micro-biological revolutions concretize themselves.

On the other hand, teacher education still happens predominantly based on cognitive elaboration separated from the educational action's concrete social relationship, of the educational action, constructing itself on processes of teaching/learning that come into effect under Popham and Bloom's arguments. Popham and Bloom had a strong presence in Brazil in the 70s and in the beginning of the 80s and they are authors not at all absent in today's educational practice, in spite of the questionings and innovative experiences presently developed.

The guiding models of teacher education developed from teaching centered on the teacher and based on separated and isolated subjects, reducing knowledge to fragments and giving emphasis to the amplitude and particularity of its contents, to teaching centered on the leaner, in which the teacher presents himself/herself as the learner's helper. In such a model psychology identifies itself as a hegemonic theoretic reference and, from the 50s to the 90s, the 'psychologizing' of education in Brazil, in some way, ended up by conducting the method reduction to tactical and strategic procedures in the classroom, strictly planned, directed to behaviouristic performance and cognitive learning.

The main point to underline is that method derives from theory. Thus, methodological orientation and strategies that are not rooted in a theoretic basis, which the teacher effectively knows and is capable of taking as a reference for his elaboration and apprehension of the pedagogic knowledge, become extremely fragile in the concrete situation of the classroom. On the other hand, pedagogical theory derives from a paradigm.

To be able to manage the paradigmatic transition happening in the world of life, of which structural components (culture, society and personality) question education and pedagogical theory whilst fundamental to realize the school's political and pedagogical proposal, education must conduct itself in a process of epistemic and hermeutic revision, realizing its course in the light of the communicative action paradigm that progressively configures itself in the scientific community and in which reason is centered in the inter-subjectivity of free communication between the social actors.

4. Swings of the pendulum or critical application of ideas? Some current concerns in teacher education

Rethinking education consequently leads to the reconsideration of teacher education.

To be able to understand that the teacher has a main role in the transformation process of education it must also be understood that the success of educational policies widely depends on the teacher education.

The teacher education system, just like school itself, is a privileged surrounding of contradictions, in which interdisciplinarity, creativity, individuation, auto formation, amongst others, are pedagogic ideals composing the pedagogical discourse, not much identified in practice; teacher education programs represent much more conceptions (opinions, beliefs, motivations) of those who organize them, than a theory resulting from the

research and analysis of challenges presenting themselves to education in the social reality (Estrela: 1992).

A pedagogic practice scientifically established demands from the teacher an attitude of questioning and an inner conscience of himself/herself and of reality. The teacher will need, in his/her education, to go beyond traditional cognitive approaches, that support on subjective reason, ready to interrogate the information society and its growing preoccupation to 'consecrate, in the scientific formation's own area, the symbiosis between scientific conceptualism and technical acting, in harmony, in its turn, with an overall vision of the world and of behaviors' (Estrela: 1992, p. 157).

The contemporary world places itself under analysis in the information society perspective, identified as a third industrial revolution, of which strategic resources and transforming agents are knowledge and information. In this context, in which the reconstruction of reason itself occurs, transiting from the subjective paradigm of an individual conscience to the inter-subjectivity of free communication between the social actors, one questions the predominance of cognitive and instrumental rationality, appropriate by the sciences of nature representing modern science's paradigm.

Thus, to reconstruct education so as to respond to the present reality's demands, considering it as a propeller of contemporary societies, means to favor its active role in the promotion of potentiation of cognitive, practical-moral, expressive-aesthetic development, in the living of cultural tradition, convivial relationships and personal identities.

If the basic enunciation of *what to learn, when* and *how* the collective learning by the human being, of his/her humanity, placing education *on* and *since* the world of life, education will then be a process in which "teacher and pupil elaborate, in common agreement, concepts which they will work with to understand relations they will deal with" (Marques: 1992, p.561).

Teaching practice is based on the pedagogical triangular design (knowledge, teacher, pupil) and relationship between these elements cannot exclude neither one of them, once education is understood as the process described in the former paragraph. Such practice as well as the awareness about the enunciation on which it supports itself are questions of the debate on teacher education and on what is characterized as teacher's profession.

At this stage of the argument, the nodal point is placed in specific focus: education in school is a prime instrument of citizenship and the quality of

education brings about contents related to the human condition (values, affections, identity, beliefs, aspirations, opinions, interests, for example) and to the transmission and construction of knowledge. The teacher, as agent of this task, should be well prepared to face his/her challenge: he/she is the main agent of reality's innovation and should be capable of overcoming former practices and strongly rooted traditions (Demo: 1993, p. 2).

Teacher education therefore requires an enriching curriculum, propagating the development of his/her critical and creative mind founded on his/her system of values. Thus, the curriculum should characterize itself as a pedagogical action that will permit him/her to prepare himself/herself to fulfill his/her social role, strongly inherent to his/her political conscience; this curriculum should represent the education of a professional who will approach reality in a critical and creative manner and who will live, together with his/her pupils, such relationship with the world.

The substratum that will propitiate to the teacher experience, comprehension, knowledge and the competence to teach (Saviani: 1985, p.61) will be substantiated by a knowledge context that can develop analytical ability and that can favor scientific rigour. Such knowledge context, which will take part in the curriculum proposal, will be constituted by the support of research contributions and, therefore, based on the scientific method.

Well, let us focus again on teacher education and its theoretical support provided by the educational field, emphasizing the importance of theoretical studies so as to assure the critical analysis of the theoretical and conceptual dimensions of teacher education and of the ethic principles of teacher's practice. The teacher's performance, however, although depending on the quality of the preparation received, does not only depend on it; it becomes necessary to consider exogenous factors that intervene in teacher's practice to evaluate, amongst other problems, "the maladjustments found in the different roles performed by the teacher, the conflicts with the imprisoning rationality, characterized in the educational system, institutionalized during its development, and the conduct and personal work style of the teacher himself/herself" (Nogueira: 1995, p.9).

The curriculum proposal should be orientated so as to benefit teacher's ability to respond to the challenge of experimenting a new path to apprehend reality and intervene in it, once the teacher, as already mentioned before, identifies himself/herself as a subject/agent of the transformation process inherent in society. On the other hand, institutions responsible for teacher

education should establish guiding lines in the sense to promote the necessary convergence of the paradigms of its pedagogical proposal with the requirements of the educational practice in the classroom.

However, consideration should still be given to two other questions present in those institutions. The first question reports on how to overcome the usual negligence of the educational system when requirements of scientific epistemology are considered at the academic level of graduation; the second one inquires on the level of culture and proficiency presented by the student in his/her knowledge area. These questions pronounce themselves in front of the argument that a proposal of teacher education should give strong emphasis to the development of academic competence and emphasize theoretical paradigms of values, so as to strengthen the teacher's political ability to understand and assume his/her role. In addition, basic principles orientating such education are identified as: personal commitment, the meaning of education for the teacher and the living and hierarchizing of values (Nogueira: ibid, p. 11). There is, therefore, a set of elements in teacher education that, by nature, demand the analysis of the educational system relationship with the propositions of graduation courses and a critical eye on the agencies, taking into consideration the particularities of their students.

On the other hand, such elements, generators of suppositions and hypotheses, raise several questions concerning educational policies and models of teacher education. However, the main purpose of this paper imposes that the theoretical basis of a teacher education model be the focus of analysis and that, taking into account the assertives already endorsed, educational practice be a second point to be focussed.

Therefore, educational innovations, as well as the incorporation of information and communication technologies are approached.

The school should transcend its traditional instructional-adaptative function and conduct its other functions, which are political, cultural, economic and academic (Silva: 1991, pp 34-35). In the information society scenario, the school must remain alert to the impact of the social and cultural processes accelerated by the progress of science and technology, mainly, when it attends to populations who do not share the universality of knowledge and the mastering of technology at the same intensity level that other children and adolescents may benefit, at national, regional, local or even worldwide levels.

In the meantime, it must be recognized that the democratic access to new

technologies does not only depend of the social actors who belong to the educational system, but that 'the role of the government is essential to guarantee access for all to these new cultural codes and channels' (Tedesco: 1997, p. 1). Therefore, some questions are under the scope of governmental educational policies.

Furthermore, the use of new teaching technologies does not necessarily configure in innovative approaches to learning just only representing a support to traditional teaching methods and one of the main worries being thought of is how the technological instance configures itself before the pedagogical instance and, moreover, what modern information technology brings to education (Dunley Jr: 1995, pp 424-425).

There is a wide spectrum of aspects to be taken into consideration as for as the use of new technologies and its implications for the role of the teacher are involved , but a recommendation found in Dunley Jr (ibid, p. 430) should be carefully considered

'... the use of information and communication technologies demands psychological and sociological monitoring of its practices, so that the ideology of productivity in education does not become an end in itself, generating a perverse and not expected psychological and social cost'.

According to the International Bureau of Education (1997, p. 5), it must still be considered that:

'There is a growing recognition that it takes considerable time for technological innovation to be fully integrated into existing institutional structures and that expectation for rapid acceptance of and adaptation to the technologies on the part of teachers are unrealistic'.

When thinking about knowledge itself, built out of theoretical basis, as well as the strong ideological burden inserted in the educational practice and innovation requirements, the relevance of the theoretical basis for a teacher education model is understood. The lessons of theory may nourish experiences and lead to an innovative practice, in which ICT's incorporation will not only represent didactic and methodological alterations, once ICT is a privileged instrument to deal with the expected opposing attitudes towards change, the concealed non-acceptance and very slow process of adaptation, which break the timing demanded by the dynamics of the transformation process.

Recommendation 4, of the *Final Report and Recommendations of the European Countries' Council Seminar*, held in Turkey in May 1993, on the

theme *Politics and Teacher Education Models*, expresses that teacher education programs should include, amongst other items, educational technology (1993, p. VI), arguing for technology as a resource to promote learning. This recommendation favours the questioning whether informatics in education, characterizes itself as a new practical action, producing an effective qualitative leap and moving the axle of educational practice from the traditional to the innovated?

5. Problems and concerns: they may not always be succeeded by appropriate action to meet the needs of TE

A certain disappointment remains when traditions, beliefs and opinions still predominate in the construction of TE models and that other starting points, such as professionalism, integration and universitisation have also performed an important role in the reforms and implemented innovations, leading to trends of little consistence, without characterizing substantial reforms (Buchberger: 1993, pp 1, 2).

Reforms that have occurred in the last twenty-five years are questioned whether they really provoked substantive changes in teacher education or whether they only represented adaptations and/or modernizations. Substantial reforms are imperative for the development of quality and, necessarily, must radicate themselves in three fundamental points: 1) theoretical frames and principles rooted in research outcomes; 2) planning and 3) expertise of the teachers' educators (ibid, p. 2).

In the information society, the teacher faces the challenge of expectations and tasks that suffer an accelerated process of change and that are progressively enlarged, expectations and tasks that emerge from changes occurring in the family structure and at work, from new technologies, from the knowledge explosion, from the widening of the geographical horizon, from questioning and redefinition of values, from multiculturalism, for example. However, teachers have demonstrated lack of competence (or, at least, little presence of) to deal with the process of accelerated change lived by society and with the concept of education rooted in demands created by such process. Their preparation can be identified as one of the factors which contribute to their inability to act with competence, a fact that gives emphasis to the necessity of promoting substantial reforms in such preparation.

Therefore, what can be considered a nodal point is that teacher education claims a solid theoretical basis. Theoretical knowledge becomes the support for

the development of competence in tasks that constitute the wide range of teacher's acting: educate, teach, evaluate, counsel, innovate and develop administrative activities (Buckberger: 1993, p5); thus, his/her repertoire of professional actions should represent a set of actions orientated by a theoretical frame, that will serve as a guiding line to attain objectives, perform tasks and experience situations together with his/her students.

The competent, reflective and innovative teacher does not elaborate his/her practice based on common sense, but on theoretical knowledge. His/her competence will be developed by a teacher education model that considers the relevance of theoretical frames in its design and which paradigm identifies itself with the paradigm of educational thought and educational action. This model should promote the construction of a theoretical reference that will orientate the pedagogical practice of the professional being prepared.

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A ROLE FOR CONTEMPORARY LEARNING THEORY IN THE DEVELOPMENT OF OPENNESS TO CULTURAL DIVERSITY

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This research reviews the social learning theory of Bandura and the social development of cognition theory of Vygotsky and examines how teachers, using these theories, can work toward developing within students an openness to cultural diversity. Most people recognize that children do what they see modeled and that they adopt adult or peer behaviors because that is the exposure they have. What students see in the home, at school, on the playground, or on television may be the limits of modeling available for them upon which to base their behavior.

It is important that the teacher plan effective social learning interactions within the classroom that will allow each student to learn, to the extent possible, through observation and social interaction those behaviors and attitudes that will provide children and youth with a basis for generating habits related to a lifetime of positive openness to cultural diversity.

A model showing a functional combination of portions of these two theories is offered and suggested

Teaching methods based on the importance of modeling activities related to cultural diversity are explained.

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Alice: "Would you tell me, please, which way I ought to go from here?"

The Cat: "That depends a good deal on where you want to get to" (Lewis Carroll, 1951 as cited in Cushner, McClelland, and Safford, 1992, p.3).

Our goal is more effective multicultural education that results in a greater openness to cultural diversity. Given that we have our destination, we also have our direction. This research was undertaken to determine if there may be effective methods of multicultural education developed from possibly overlapping philosophy, theory, and models of two specific psychologists in the area of learning theory: Albert Bandura and Lev Vygotsky.

Bandura

In a brief review of selected components of Bandura's and Vygotsky's theoretical models, some commonalities seem to appear. It is as if the two theories intersect at a point. Where is that intersection? How can that be applied to the teaching/learning of multiculturalism and cultural diversity? First, let us review three components of Bandura's social cognitive theory:

Modeling.

Learning based on observing the behavior is called modeling, an effective teaching tool. Bandura (1986 cited in Good and Brophy, 1991) found that observers can frequently imitate the observed behavior without reinforcement or practice. Miller (1993) indicated that, based on Bandura's laboratory research, viewing aggressive models increases subsequent aggression.

What Bandura initially called observational learning (what happens when people learn by watching others–more than just a simple imitation of others' behaviors) has now evolved into social cognitive theory. This theory "examines

the processes involved as people learn from observing others and gradually acquire control over their own behavior" (Eggan and Kauchak, 1997, p. 214). Bandura indicated that his social cognitive theory relies heavily on parent modeling of behavior as well as the modeling of adult speech.

There is an implied admonition here for us to practice what we preach. According to Good and Brophy (1991), modeling more frequently occurs in situations in which we are not sure of what we are to do; we're learning how by watching how others do it. The old adage of when in Rome, do as the Romans do lends itself to this idea. When we are in a different situation or place, we first of all see what those do who are accustomed to that situation or place.

Imitation is a powerful and effective teacher. Bandura and Walters (1963 as cited in Miller, 1993) felt that relatively new behaviors can be duplicated simply by observing that behavior modeled. Among behaviors that teachers should model before their students is the process of thinking out loud when trying to solve problems. The students can then understand how to develop and sequence the steps of solving their own problems. An important concept is to consider asking how to find the answer instead of asking who has the correct answer.

Bandura and Walters (1963 as cited in Miller, 1993) thought that teachers should share their thinking processes because those processes may not be obvious to students but are important in establishing those processes in the students' minds. They could first verbally define the problem and their thoughts about possible solutions. As they do this aloud, students can follow and develop that thought train in their own minds. The modeling of rational problem solving in front of students can help all students but particularly those from disadvantaged backgrounds that feel helpless and passive about their adversity.

Bandura (1969 as cited in Miller, 1993) indicated that the effect of modeling punishment may be to control misbehavior but that such modeling had no effect on the substitution of producing good behavior because no desirable behavior was modeled and observed. In using modeling as a learning strategy, students may imitate inappropriate or irrelevant behaviors unless they have pointed out to which behaviors to model (Bandura 1986 cited in Eggan and Kauchak, 1997).

Self-Efficacy.

Dweck & Elliott (1983 cited in Good and Brophy, 1991) found that students are more motivated to complete tasks that are of moderate difficulty and that they pursue success instead of trying to avoid failure. Bandura and Schunk (1981) in research on efficacy perceptions found that effort and persistence were improved if the individuals felt successful or competent, i.e. their self-efficacy; their belief in their own ability to cope with difficulty. Good & Brophy (1991) indicate that modeling behaviors of confidence, persisting, and searching for a better strategy for students when they encounter frustration is an especially useful teaching strategy. Bandura emphasizes self-efficacy as people's ways of successfully managing and dealing with their environment (Miller, 1993).

Levels of Success

Good and Brophy (1991) speak of Bandura's levels of success as "success achieved through reasonable effort" (p. 282) related to teaching goal setting, performance appraisal, and self-reinforcement. The goals should be proximal (here and now), specific, and challenging. Students should assess their own performance against their previous performance, not against that of others, and lastly, if they know how to evaluate their own work, they will reinforce their own successes. They may need help from the teacher at all stages of these efforts. In helping students judge their own success, it is helpful for them to set goals. This is especially effective when the goals are proximal not distant, specific not general, and challenging, do-able but difficult. (Bandura & Schunk, 1981; Tollefson, Tracy, Johnsen, Framer, and Buenning, 1984 cited in Good and Brophy, 1991).

Vygotsky

Vygotsky was a Russian psychologist who received his Ph.D. in 1925. From then until 1934, he researched and lectured; he died of tuberculosis in 1934. His work was finally published in the free world in 1956; it had been banned in Russia until that time because of political decisions. According to Tharpe & Gallimore (1988), many researchers, including Bruner, have based their research on Vygotsky's ideas. Moll (1990) has indicated that Vygotsky is considered a genius and that his work becomes more relevant with the passing of time. The three underlying themes that characterize Vygotsky's social-cognitive theory of child development are:

1. the role of language

2. the importance of culture

3. the idea of a zone of proximal growth (Eggin and Kauchak, 1997).

Language

Vygotsky (1962 as cited by Benson, 1997) felt that the development of thought and speech were separate until the child is about two years of age. At that age they join and become a new form with the thought becoming verbal and the speech becoming rational. Interpersonal social activities can accelerate this development and the lack of such interpersonal activities can slow the development. Miller (1993) indicates that language and thought appear to be independent until they merge to produce symbolic thought.

Vygotsky believed, according to Hamachek (1995) that children use language not only to speak with others, but as a way to plan their own activities; this is called inner speech. Did you ever talk to yourself when organizing something? Then you have an example of inner speech. Watch children playing alone; they use this inner speech to think through their play processes.

Vygotsky's theory values interactive opportunities and experiences and it is his belief that the learner constructs his own knowledge. He felt that the child develops into the intellectual life in his surroundings through internalized social interaction and language (Eggen and Kauchak, 1997).

Culture

Vygotsky believed that the child's culture is important because that is the social environment in which he interacts with adults and more capable peers (Hamachek, 1995). Although most of his work was done on language development in the child, Vygotsky (1978, as cited in Social Development Theory) felt that social interaction was a fundamental basis for the development of cognition. He indicated that every function in the child's cultural development appears twice: first, on the social level, and later on the individual level; first between people (interpsychological) and then inside the child (intrapsychological). This applied equally to voluntary attention, to logical memory, and to the formation of concepts. All the higher functions originate as actual relationships between individuals.

"Vygotsky emphasized that the history of a culture powerfully shapes all levels of contexts. Wars, natural disasters, revolutions, and civil rights movements reverberate at all contextual levels. At any one point in history, a

culture is both a product of its own history and a provider of contexts that shape children's development and, consequently, the future of the culture" (Miller, 1993, p.378).

Although some who study cultures emphasize differences, we must remember the universality of characteristics of cultures. If we think of culture as a medium, then it is responsible for the organization of the child's everyday activities. More remote levels of thought to the child, such as cultural beliefs, generally come to the child through an intermediary, a parent, a sibling, or a peer who encourages and reinforces those beliefs.

This process of transferring beliefs and knowledge is Vygotsky's most well-known concept: the zone of proximal development (Good and Brophy, 1991).

Zone of Proximal Development

A third aspect of Vygotsky's theory (Vygotsky, 1978) expounds on the notion that the potential for cognitive development is limited to a certain span called the zone of proximal development. This development depends on full social interaction. It should be noted that the range of skills developed with guidance will be greater than the range of skills developed by the child alone. Vygotsky felt that the development of consciousness was the end product of social (interpsychological) interaction.

The zone of proximal development is the stage of current capabilities. This is the zone in which a child is close to being able to handle certain problems. Within each stage, or zone, there are some problems the child can perform himself, but others with which she needs assistance. Vygotsky felt that this zone was the point at which a child could best learn because he was in a stage of readiness (Hamachek, 1995).

Good and Brophy (1991) explained that continually challenging students within their zones of proximal development is necessary. Vygotsky defined the zone of proximal development "as the distance between a child's actual developmental level as determined by independent problem solving" and the higher level of "potential development as determined through problem solving under adult guidance or in collaboration with more capable peers" (Vygotsky, 1978, p. 86). A more competent person collaborates with a child to help him move from where he is now to where he can be with help.

The person who assists in the zone of proximal development can build bridges or scaffolding to hold the child in his construction of knowledge, skills, and attitudes. This ties into Vygotsky's view that the child constructs his own knowledge.

Vygotsky felt that process is more important than product. In instruction, the child becomes involved in reciprocal teaching when his role alternates between that of the one who questions and the one who answers (Vygotsky, 1978). "The Vygotskian view of what develops is very broad: a culture (socio-cultural history), a species (phylogensis), a child (ontogenesis, and a cognitive skill (microgenesis)" (Miller, 1993, p. 407).

According to Hamachek (1995), Vygotsky's theory has three educational implications: the importance of language in the development of intellectual functioning, the cultural and social development's effects on the cognitive development of the child, and the importance of teachers' staying at the leading edge of the child's zone of proximal development (assisted discovery).

Likeness of Theories

In the three components of each theorist chosen for comparison, Vygotsky's interaction of the child with others in his theory of culture is similar to the modeling advocated by Bandura. Bandura's theory of self-efficacy and the Vygotsky's language development theory have, in common, thought and speech development and the construction of the learner's own knowledge. Vygotsky's zone of proximal development holds similarities with Bandura's levels of success. Parts of all six theory components bleed over into other components; it would be difficult to box them in neatly. The synthesis of the six parts appears to be more alike than a comparison of the parts separately.

Methodology Considerations

Cushner, McClelland and Safford (1992) refer to the transcendent goals of teaching: helping students develop a positive self-image (am I a good person?), a personal identity (who am I?), a sense of pride (in their own group), a sense of connectedness (with others), and a sense of confidence (of their ability to do what needs to be done as defined in Bandura self-efficacy). Hall, Wallace, and Dossett (1973) give six stages for teachers to move through as they face innovation such as in developing an openness for cultural diversity:

Level 0 Awareness
Level 1 Informational
Level 2 Personal (how he will be involved)
Level 3 Management (the nuts and bolts, the specific tasks)
Level 4 Consequence (impact)
Level 5 Collaboration (thinking of who else will be involved in a cooperative venture in carrying out this venture)
Level 6 Refocusing (benefits, alterations, and modifications)

As teachers are aware of these stages (Level 0) of their own development, they may help themselves move from one stage to the next by self-reinforcement, and by getting an assist from a peer or knowledgeable mentor as they move through their own zone of proximal development at each stage.

Suggested Classroom Methods

Cushner, McClelland, and Safford (1992) gave the following suggestions for teaching diversity; enhancements have been developed by this researcher to utilize selected components of the theories of Bandura and Vygotsky. A major key to the success of the enhancements is the availability of appropriate adults and young people to maximize the ratio of visitors to classroom students.

1. The use of story telling. Include stories from other parts of the world. Examine the characters and compare them to characters in the local area.

Enhancement: Bring in storytellers from a variety of cultures. Ask that to dress in their cultural costume and use props that can be identified with that culture. Have each storyteller work with a small group of students to help them develop stories about their own culture to tell to the group under the assistance of the adult storytellers.

2. Grow a family tree. Discover what life was like where your ancestors grew up.

Enhancement: Post a large world map and prepare several pins with each student's name. Stick the student's name pins in the sections of the world where her ancestors lived. This will demonstrate some likenesses the students would never have guessed before.

3. Study and visit places in your community that are not well traveled, i.e., in a study of architecture, look at the various church and government buildings.

Enhancement: Ask adults who work with building design, construction, and maintenance to accompany students on such a field trip. Each adult can share the effect his culture has had on various buildings and can work with small groups of children to help them to see their future in the establishment of the architecture of the future for the community. They can envision what changes will occur, for what purpose, and by what effect.

4. Consider proverbs from a culture; explain the meanings of these proverbs to see what commonalities they have; re-state those same proverbs in a more familiar language.

Enhancement: Invite adults or young people from the community who have a background with the proverbs you choose. Have them work with small groups of students, having students interpret the proverbs, compare their interpretations with other students, and, with the leadership of the visitors, develop some proverbs of their own that reflect their individual diversity. These should be developed with pride.

5. Review recent newspaper and magazine articles about multicultural issues. What are the implications of these articles?

Enhancement: After students have considered the implications of the articles, have a pair of diverse students re-write each article to see how it could be stated in a more accepted and less divisive manner. If an initial article is culturally fair and open, that article could be used as an example. Students could follow-up with a visit to the newspaper office to talk with reporters. In the event, articles have been inappropriate, a reverse modeling effect may occur from the students to the reporters.

6. Interview students who have attended classes in your school but whose first language is not English. Discuss with them the problems they had and what seemed to help them.

Enhancement: It is important to choose students whose self-efficacy can withstand such a discussion; we would not wish to exacerbate a situation. This could be a multi-grade event and the older students could assist the young students through stages of problems (their zone of proximal development). If English as a Second Language students are hesitant to talk before a small group of listeners, an audio tape may be utilized. For those who are well adjusted and blossom with the attention, a videotape may be developed. When taping, questions and points of discussion should be developed ahead of time by those conducting the interviews.

7. Discuss chores that individual students have to do at home. How does this cross cultures?

Enhancement: This could be hailed as an efficiency measure or a quality control study. Students could compare their lists of chores at home with each other, giving an approximate amount of time required. Then students who have worked out a faster or easier way to accomplish the same thing can share their ideas. Some of the quietest, most introverted students will impress the others because of their designs at getting their chores done.

8. Each student in class interviews eight people and asks their definition of community. Then all students compare their answers for likeness and differences.

Enhancement: A record of the diverse origin of the people interviewed could be maintained and the comparison of like and different answers is compiled. Students can project theories as to why those particular answers were given. What effect did the diversity element cause in determining the answers? How could the answers have been different based on a different diversity?

Additional suggestions (Hall, Wallace, and Dossett, 1973) for modeling diversity and multiculturalism in the classroom include the following:

1. Do a community analysis survey

Enhancement: Students could map the community, indicating the locations of schools, churches, social service agencies, playground, movies, grocery stores, where gangs hang out, where drugs are sold, where unemployed men gather to wait for work, and other locations that exist in the community that tell the story of the diversity of the community. A group of community leaders such as the mayor, school superintendent, school board members, and a group of regular citizens could be the audience to which the class explains their survey and results. This could be an interesting project to invite the news media to review.

2. Plan a birthday (or seasonal) party for someone of another culture. Use foods, costumes, and games.

Enhancement: Students could select an elderly person of a different culture each month and could prepare for the birthday party by studying that culture and surprising the person with the knowledge gained by the children about the person's culture. On the appointed day, the selected visitor could review the children's work on her culture and could add historical and cultural notes that would be interesting to the children.

3. Work with children to analyze what they see as their differences and their likenesses. How do they see the need for an Individual Educational Plan?

Enhancement: The guidance counselor and resource teachers can assist with this activity, working first in groups for self analysis and then working individually. Work with likenesses initially, and as they begin work on their differences, they may find that their differences are more interesting than

shameful. They may wish to work out an individualized education plan for themselves; this self-reinforcement is difficult alone, but their peers may help each other move through this stage of thinking (zone of proximal development. Such development is essential for self-efficacy.

4. Have students interview someone from another school. Have students as a group beforehand prepare the questions to ask.

Enhancement: Ask a school leader at another school to provide a list of diverse students for your class members to interview. Have your class discuss what kinds of questions to ask, what kinds of questions to avoid and why. Help them prepare to treat all those being interviewed in a kind and patient manner. This preparation will help them reflect on their own feelings about being different from someone and should engender empathy and sensitivity.

Most of the activity enhancements listed above can easily be accommodated through cooperative learning groups. Thomas, Chinn, Perkins, and Carter (Summer 1994) indicate that cooperative learning will promote positive interdependence and social skill development and "holds promise for enhancing cross-cultural relations" (p. 200).

Junn (Summer 1994) recommends the use of role playing to help students in multicultural understanding. This is based on the adage of "Tell me and I will forget; show me and I will remember, and involve me and I will understand" (p. 102).

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THE ADVANCEMENT OF A TECHNOLOGICALLY ORIENTED COMMUNITY BASED SCHOOL CURRICULUM IN PARTNERSHIP WITH REPRESENTATIVES FROM TWO PUBLIC SCHOOLS, A COMMUNITY COLLEGE AND TWO UNIVERSITIES

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This paper is the last of a trilogy of papers designed and directed by the writer on Outreach and Access Partnership programs.

The first paper presented the key aspects of a mathematics tutorial program designed to boost assessment test scores for sixth grade students in a small public school district. This program is presently in its fourth academic year, and continues with the original goal of improving student outcomes, on standardized tests. Forty two students were in the original program and now it has increased to sixty three sixth graders selected from across the Willingboro, New Jersey Public School District.

In the second paper the writer dealt with faculty development necessary for the George Washington Carver High School of Engineering and Science (Philadelphia, PA) teachers to support the creation of a pilot mathematics / science / technology curriculum modeled upon Drexel's E^4 curriculum, "An Enhanced Educational Experience for Engineering Students." The E^4 approach uses engineering design and a focus on real world problems to integrate the basic elements of mathematics, science, and engineering along with humanities, communications and management skills. The goals of Carver's new MST Curriculum focus on the enabling of students: (1) to learn mathematics, science and technology "as needed" in the context of hands-on-learning, (2) to effectively use the design process as a means to integrate this knowledge and (3) to build learning skills by engaging in team based learning.

This last paper will focus on some specific aspects of the Exodus-To-Excellence church / community based partnership with other formal

educational institutions with students who, for the most part, reside in the West Philadelphia Community which is the geographical location of Drexel University. The program is value driven in the sense that it makes explicit the values which underlie the various components of the program to include the academic, the cultural and religious orientation.

Mostly, the paper will focus on the "Summer Algebra" component of the program, which looks at an alliance of five professionals who operate as a team and demonstrate, in the highest order, for the students project management / team oriented problem solving techniques and skills as preparation for tomorrow's workplace for persons pursuing careers in mathematics, science, engineering and technology.

Even though this program was in its fourth summer, this was the first summer for a full complement of experienced faculty and the three courses (Mathematics, Communications and Computer Laboratory).

The first year the program ran for fifteen days with fifteen students with only algebra and computer laboratory. The second summer program ran for sixteen days with thirty-five students for algebra, 8th grade mathematics and computers, and in the third year there were the same courses, but with sixty students.

The Summer Program Curriculum

It is worthwhile to note that the summer program held at Drexel University is just one aspect of a K-12 community based program sponsored by the White Rock Baptist Church within the West Philadelphia Community. By design, the summer aspect would involve no more than fifty students in grades eight, nine and ten with a focus on technology within the curriculum foci of mathematics, computers and communications.

Computer Laboratory

The major emphasis for the computer laboratory was on problem solving. Students were required to select at least one problem (local, national, or global) and make suggestions as to how it could be solved, or how it could be eliminated. Students were required to state the problem, develop and list the plan to solve it, go online to get information / use a spreadsheet and / or charts to support their work and to use skills being learned to help create the report.

Communications

Students were expected to do a research project that would serve as the pivotal point for the summer course. Students selected an individual from a list provided to them. They made their selection based on career or personal interest in the individual.

The students had to become familiar with and learn to use Drexel's library; learn basic research skills; learn to select appropriate sources; learn to take notes, learn to organize information and put it in a required format with the outcome of the project in a meaningful essay about the person whom they researched.

Additionally, the students were expected to do the following:

- Use the computer to practice word processing skills by writing their essays on the word processor.
- Make an oral presentation of their research findings to be video taped to practice public speaking, correct pronunciation, clear enunciation, appropriate tone of voice and language.
- Further development of vocabulary.
- Practice appropriate behavior in an academic setting.
- Do journal writing
- Get a general understanding of group dynamics and leadership skills through group work and collaborative learning.

The professor in charge of the communications component hoped that these students would grow in self-confidence, be able to identify and correct some of the behaviors that might impede their progress in the "real world", learn to respect themselves, their immediate peers, and others, and learn that they have the power to take control of their lives . . . to become proactive and not reactive.

Mathematics: Based on experiences in the mathematics classes of previous summer programs and feedback from the academic year participants, both faculty and students, a decision was made that two hours of mathematics per day would be necessary to better prepare the students to operate in a team format, with reference to solving problems involving applications of concepts learned. All three mathematics classes were in session for two consecutive hours with the first hour devoted to a lecture / presentation and demonstration

by the instructors and discussion / recitation by the students. During the second hour students were placed on teams, with a team leader, to solve sets of applicatory problems.

The content of the eighth, ninth and tenth grade mathematics follows.

Grade Eight - Applications of Equations and Inequalities

- Consecutive integer problems
- Money value problems
- Motion problems
- Lever and pulley problems
- Angle and triangle problems
- Perimeter and area problems
- Problems for pleasure
- Properties of exponents and scientific notation
- Multiplying and dividing polynomials / factoring

Grade Nine - Applications of Equations and Inequalities Continued

- Solving equations by multiplication and division
- Applying ratio and proportion
- Percent / using percent to solve problems
- Similarity and similar triangles
- The straight line / graphing
- The slope of a line and the equation $y = mx + b$ (applications)

Grade Ten - Applications of First degree equations and inequalities

- Geometry / measures of angles of a triangle
- Supplementary and complementary angles
- Applications of ratio and proportion
- Solving fractional equations / real world applications
- Solving and applying systems of linear equations
- Solving quadratic equations and how to use them in solving real world problems

All three mathematics classes ran for two hours every day with the first hour being utilized for explanations, demonstration and recitation, with the second hour for team work in problem solving arithmetical projects.

Instructional Methodology

For each of the separate courses (Mathematics, Computer Laboratory and Communications) at each of the grade levels (eight, nine and ten), it was agreed that our approach would be lecture / discussion, recitation and teamwork in a laboratory setting with mathematics interrelationships to communications and the computer laboratory.

It was intended, especially by the communications instructor, that students would be self directed in learning, displaying responsible citizenship within the context of communications and technological competence.

The mathematics and computer laboratory instructors taught teamwork assessment in an informal way after a more structured lecture / discussion / recitation class setting. Students were implicitly taught team participation roles and responsibilities and did this through journal documentation. Through these classes students were taught how to describe steps of problem solving tasks and to link the content of life experiences and applications.

An action oriented context for individual student assessment was established and informal instructional meetings took place between classes to keep program and student outcomes visible at all times.

Throughout the course of the summer program the instructor placed increasingly greater emphasis on the students exploration of their own learning attitudes and values. It was intended from day one that for most of the time the students would be more often active learners rather than passive learners. The students would have to participate directly in mathematics, communications, the computer laboratory and in recreational activities.

In the process of promoting project oriented / team structural learning activities, the following assumptions were made with reference to strategies which tend to promote active learning in the classroom:[1]

- Students are involved in more than listening
- Less emphasis is placed on transmitting information and more on developing students' skills

[1] Bonwell, Charles and Eison, James A.; Active Learning: Creating Excitement in the Classroom; ASHE, ERIC, Higher Education Report # 1, 1991

- Students are involved in higher order thinking (analysis, synthesis, evaluation)
- Students are engaged in activities such as reading, discussing and writing.
- Greater emphasis is placed on student's exploration of their own attitudes and values.

The Summer Program Faculty / Staff Team Collaborative Efforts

As stated earlier in this paper, the extraordinary success of this past summer's community based technologically oriented program must be attributed to the "team", that is, the director and the four faculty.

This "team", in terms of selection process, credentials, work ethic, dedication, commitment, concerns for students' achievements and experiences was well beyond what researchers say is needed for a quality and successful faculty / team collaboration.

It is worth noting that the team's composition was the following:

- Program Director, Mathematics instructor from Temple University, Philadelphia, Pennsylvania
- Communications Component, Professor of Humanities and ESL, Delaware County Community College, Media, Pennsylvania
- Eighth Grade Mathematics Component, Teacher, Andrew Hamilton School, Philadelphia School District, Philadelphia, Pennsylvania
- Computer and Ninth Grade Mathematics Components, Teacher, Henry C. Lea School, Philadelphia School District, Philadelphia, PA
- Drexel Campus Coordinator and Tenth Grade Mathematics Instructor, Professor of Mathematics, Drexel University, Philadelphia, Pennsylvania

The research literature on the theoretical dimensions of academic collaboration states that the single theory that is most useful for analyzing and understanding team efforts among faculty is the theory of negotiated order.[2] The team mentioned above didn't seem to have a negotiated order, all team members were equitable stake holders within the framework of the development of "joint appreciation" of what each had to contribute as well as how it would be contributed. It seemed as though all five individuals just made the connection on the premise that the program would be focused on applications of information and knowledge gained.

[2]Austin, Ann E. and Baldwin, Roger G., Faculty Collaboration: Enhancing the Quality of Scholarship and Teaching, ASHE-ERIC Higher Education Report # 7, 1991

The group dynamics of the team mentioned above worked through the cyclical and sequential phases of group development without stating them, mainly because of the previous work relationships that each faculty member had with Exodus-to -Excellence Academic Year program director. The director helped each of the participating faculty of the team to maintain the group's norms, the decision making process, patterns of communications and interpersonal structures.

As the members of the team look back on the summer program, all tend to believe that each had command of an array of necessary interpersonal skills. All were very good communicators, all were good listeners and good speakers so that the team was able to function efficiently and effectively, even though each functioned in different ways because of varied experience , backgrounds and orientations.

The intellectual background of the five persons, without trying to do so were a match rather than a complement which perhaps accounted for a big part of the high success level of the summer technologically oriented program.

All members of this collaboration seemed to have had the same work pace, energy level, attention to detail and concern for the students in the program.

At the closing exercise of the program (see Appendix A) acknowledgement of the efforts of each team member was given by virtue of the role played in this exercise.

Evaluation

The goals of the program were to expose students to project manager / team oriented problem solving techniques and skills as preparation for tomorrow's workplace for persons pursuing careers in mathematics, science, engineering and technology; to show this by a model example, utilizing the team of instructional professionals and to demonstrate how values gained through this community based and church related academic year program permeates the infrastructure of project and team based curriculum development. Couched in this set of goals was a deliberate attempt to explore the dynamics between and among the five professionals (four instructors and the director) who would become the Project Manager / Team for the 1997 Campus Summer Mathematics program.

The evaluation plan was designed to answer the following questions:

1. To what degree were the project (Summer Program) goals met?

2. What were the participants' experiences with regard to the project's goals?
3. What were the constraints and difficulties of the program and how were they addressed?
4. What were the significant factors, aspects, characteristics and outcomes of student learning?
5. How will this successful summer component model be implemented within the framework of the academic year portion of the church / community based program?

Results Summary

The five professionals who worked this program, especially the four instructors, agreed unanimously, that we could not sustain the efforts and intensity of this kind of summer program for more than twenty days of instruction. (All four instructors had taught full time during the academic year). All agreed that instruction and academic content had to be placed within the context of real world applications that were interdisciplinary and would provide a longer time line for library research, problem solving, communication, teamwork and presentation.

Recommendations

Based on the results summarized in the preceding section, the following recommendations reflect ideas from students, program director, and the program's instructional staff.

1. Make experienced, well prepared and dedicated staff a continued priority.
2. Establish a visible relationship between the Director of the program and key administrators at Drexel University. i.e. Dean of Enrolment Management, Office of Student Information and Records, the Office of Computing Services and the department heads of Mathematics and Computer Science and Humanities.
3. Build a stronger linkage to and with key industrial and business firms in order to develop venues for student internships.
4. Provide for academic year follow up at the receiver schools of the students in terms of achievement, performance, in general, and specifically, improvement on national or region wide assessment test scores.

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Appendix A

*Exodus-to-Excellence Summer Program
at
Drexel University
Philadelphia, Pennsylvania
August 1, 1997
(11:00 A.M.)

PROGRAM

• Welcome and Remarks Professor of Mathematics and	Dr. Ewaugh Finney Fields Dean Emeritus, Evening and University College
• Student Production / Video Tape	Dr. Gwendolyn Anderson-Walitho Professor of English / ESL Delaware County Community College Media, PA
• Certificates of Attendance	Dr. Ewaugh Finney Fields
• Student Awards -Recreational (Bowling, Basketball and Double Dutch)	Mr. Ralph Bell Executive Director, ETE
Academic and Leadership	
• Communications	Dr. Anderson-Walitho
• Mathematics (Grade 8)	Mrs. Jacqueline Edmond Mathematics Teacher Andrew Hamilton School Philadelphia School District
• Mathematics (Grade 9)	Mrs. Oteria G. Trapp Mathematics Teacher and Computer Leader Henry C. Lea School Philadelphia School District
• Mathematics (Grade 10)	Dr. Ewaugh Finney Fields
• Acknowledgments	Dr. Ewaugh Finney Fields

* The Exodus-to-Excellence (ETE) Summer Program represents an outreach partnership between Drexel University and the ETE Program of White Rock Baptist Church 5420 Chestnut Street. The program today concludes the fourth summer for this partnership. Enjoy the remainder of your Summer!

A PRODUCT-ORIENTED COLLABORATIVE PROGRAM IN NCUE TO PROMOTING THE EXCELLENCE IN EDUCATION ON ELECTRONIC DESIGN TECHNIQUE

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ABSTRACT

Due to the rapid increase of the competition on global marketplace, the traditional training style and policy of engineering techniques need to be promoted to meet the needs of industry. The purpose of this paper is to introduce a collaborative program in promoting the education on electronic design technique. Actually, many universities in Taiwan have performed the improvement study and promotion on engineering education; that is, to put the study of curriculum and experiment instruction into effect. "Product Design and Fabrication" is one of such courses developed in the Industrial Education Department of National Changhua University of Education. In that course, students are asked to study and design an electronic product, fully utilizing the knowledge and skill they have learned in the first three years in university. To further promote the design technique in that course, we initiate a Collaborative Program with some electronic companies in local. The university provides talent design skills to the companies while the companies provide great opportunity in realistic design experience to the university. The program acts as a bridge bringing both the ideal world and the realistic world together. Both the university and the enterprises get mutual benefits from the program.

Keywords: electronics, product design, collaborative program

Introduction

Due to the rapid increasing competition on global marketplace and the fast changes on advanced technology, especially in the field of electronics engineering, working styles are changed significantly with this increased challenge. Scholars have recognized such a change that workers are expected to solve problems, seek ways to improve the methods that they use, and engage actively with their coworkers in modern high-performance workplace, rather than simply to perform well-defined tasks and leave anything out of the ordinary to their managers or specialized support personnel (Bailey 1997). Therefore, the traditional training styles and policy of engineering need to be promote to meet the needs of industry.

For more than twenty years, the movement of education reform has concentrated on changes in curriculum and pedagogy. These efforts focused on changing on school organization, teacher preparation, and the development of constructivist (Darling-Hammond 1995). The skill standards appear from a different viewpoint that focused on the reform of vocational education and on preparing students for work in modern workplaces (Grubb, 1995; Wills 1993a, 1993b). There appears to be profound difference between this reform movement. One stream is focused on reform of academic environment, that is school restructuring, frameworks for academic subjects, and raising academic requirements for graduation. The second stream is apparently more concerned with preparing students for work. This division is based on a conceptualization of education and work that distinguish mental activities from physical activities, theoretical from practical, academic from vocational, and job conception from job execution (Bailey 1997).

The Needs of Integration

However, most parts of current reform movement are challenging the conception of sharp division between academic and technical learning (Grubb 1995; Barnes 1994; Grayson 1994). The image of modern work provides a basis for the integration of academic and vocational education (Appelbaum 1994; Kochan 1994).

The constructivist perspective that underlies the school restructuring movement is based on the fact that students learn more effectively if they take an active part in the education process rather than being passive recipients of information transmitted from the teacher. Strong academic skills as an integral part of professional work, become a necessary foundation for production-level

work. Experience in or knowledge of professionalized workplace can provide a motivation for academic learning. Thus, an education in vocational environment could be an effective road to academic learning. This reform is often based on the integration of practical applications into the classroom.

The workplace is one important source of such applications. Besides, cooperation between university and industry has mutual benefits. Besides the offering of research projects, financial support, advanced facilities, and new technologies to universities, students can experience on-site teamwork, create responsibility, and train themselves to work with independent and hard-working spirits in industries. Universities, on the other hand, could provide advisory committee, skillful talents, and research findings to industries. Thus, it is an increasingly important component of many educational reform strategies to build up collaborative programs with industries and link structured work experience to classroom work as a strategy for integrating conceptual and theoretical thinking with practical experience (Grayson 1994). In the following. we will describe the curricular framework of the electronics engineering in the department of Industrial Education of NCUE (National Changhua University of Education).

The Curricular Framework of the Electronics Engineering in NCNU

The purpose of engineering education of the university is to cultivate the talents of vocational teachers and engineering technology. Besides the need of required courses in languages, mathematics, and educational theory for vocational teachers, students also need to take courses of content knowledge. The courses of content knowledge for electronics engineering in NCUE are categorized into theoretical and technical programs (Hsiao 1995).

The theoretical courses such as electronics, communication theory, circuit theory, automatic control theory, etc., are to support technical courses such as basic electronics technology, advanced electronics technology, and project assignment. The curricular framework of technology actually proceeds in three stages, that is, basic technology, professional technology, and production technology. Students spend the first two years in studying basic technology and theory. After that, students are asked to take a "competency test" to evaluate their knowledge and skills in electronics technology. The competency test is divided into two parts: theoretical knowledge and technical skills. Theoretical knowledge is measured by paper-and-pencil test, while technical skill is measured by field test. The test uses criterion-referenced standards, and is prepared by senior students under the direction of instructors.

After passing the competency test, students spend one more year of study in professional technology. For students to demonstrate their ability in integrating theory and practice, putting the study of curriculum and technical skills in one melted teapot, they need to take a "project assignment" course, named "Product Design and Fabrication," in their senior year. In this course, students perform a research-like study under the supervision and instructions of their supervisors to complete the design and implementation of course projects. Project assignment is a one-year course. Students taking that course are divided into several project teams. Students normally spend one semester to design the project and another semester to work them out. However, the course itself is lack of an off-campus training.

Promoting the Project Assignment Course

The government has paid special attention to the development of engineering education since the 70's. Quantity and quality are apparently upgraded (Huang 1995). However, most professors who earned their degree in foreign graduate school seldom have practice experience on technical engineering while have teaching and research experience. Therefore, the engineering courses are too theoretical because of professors' personal research interest and background. The courses of practical training and integrative knowledge are usually ignored.

In our opinion, we put too much emphasis on training students on how to follow existing methods to solve well-defined problems. This kind of training is basically near-sighted, analytical, and uniform (Van Valkenburg 1990). Being an engineer, those kinds of capabilities are important. However, the ability to discover, to describe problems, and to design, to create new products or method is also important and should not be ignored (Grayson 1994; Sechrist 1993). The latter one is far-sighted, synthetically, and creativity-oriented. Those are the key elements to be considered while we are reforming the curriculum.

The ultimate target of electronics engineers is to create practical and useful products. Therefore, what an excellent engineer should seek for is quality, efficiency, and taste. Engineering education should pay equal attention to the accumulation of professional knowledge, practical problem-solving ability, and far-sight.

As for the curricular goals, we believe that, besides knowledge itself, students should have the opportunity to experience the process of forming knowledge (Huang 1995; Monte 1989). As for electronics engineering, these

include three levels. Those are theory, circuits, and product design. Thus, after realizing basic theory and circuits of electronics, students are trained to apply various theories and circuits to synthesize and design electronic products with commercialized quality. However, without the communication with industry, commercialized quality of product design in the original "project assignment" course is hardly to be reached (Quinn 1993; Ernst 1990).

The Collaborative Program

As described in previous sections, there is need to initialize a collaborative program cooperated with enterprises to enhance professionalism of practical training. Students can obtain a great amount of benefits from the collaborative practical training program. Besides the application and test of theory and practice, the experience of on-site work, and the increasing of more career opportunity, students may be able to become more mature, learn more in interpersonal skills, and train themselves more with independent, hard-working and responsible spirits. We believe that it is the most important task in the curriculum design to train students to respect their works. This point should be specially emphasized in the collaborative program.

By mean of off-campus practical training, teachers and students may be far-sighted to absorb new knowledge from the outside (Quinn 1993). Also, by mean of corporation and communication with enterprises, better understanding and support toward school education can be reached. We hope the talents of electronics engineering be trained in this way. Thus, industry may take great use of those talents.

In the program, projects are initialized to solve problems found in industry. Since the initialized projects can help the enterprises to improve their processes or products, they are willing to provide financial support and facility to universities. It is common that most medium and small enterprises are lack of manpower to do research and development. Therefore, the talent and skill support from universities are quiet helpful. Students who participate in the collaborative training courses may bring up problems or questions that they encounter in facing the connection between theory and practice. They can discuss their problems with the advising instructors who respond to or solve the problems or questions. In this way, there is a mutual communication of information and knowledge between schools and industries. At the end of the course, besides the products, students of the same team also need to prepare a technical report for the team project. Students can learn writing skills in the preparation of their technical report also.

Conclusions

In the past, educational reformers have been suspicious of emphasis on preparing students for work. Too much emphasis placed on work was thought to narrow the academic learning. However, due to the changing of working styles, the reform of practical training would be appreciated the integration of theoretical thinking with practical experience.

Through the initialization of collaborative program with enterprises, students can learn real technology and develop their ability in project assignment, technical report, and synthetic solutions for the open-ended problems. Besides, collaborative programs also give students opportunities to operate the most up-to-date equipment, and to learn the newest technology, which are usually not available in schools. After the completion of collaborative training course, students should equip with sufficient ability for their professional career.

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FOURTY-FOUR ICET WORLD ASSEMBLY
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4. INTERPARATRANSDISCIPLINARY PROGRAMME FOR THE 21st CENTURY

Key-words: Solidaristic-Chaotic interparatransdisciplinarity; Talents Timely Initiation; Education-Society-Government Partnership.

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4. INTERPARATRANSDISCIPLINARY PROGRAM FOR THE 21st CENTURY

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ABSTRACT

Concerned with egalitarian education, the Brazilian Government pursues school enrolment of children between 7 to 14 years of age until 1998 (2,7 million of children are still out of school). But there are contradictions to overcome, such as: school access to all, but school permanence, progression and completion of a few; and support to elementary/high school, while shortening federal universities' budget (or vice-versa). This paper argues about social responsibility with egalitarian education, including the development of pupils/students' talents to science, music, foreign languages, computing, etc., mainly from poor families.; and a new order of relations at all educational levels and the level of people's consciousness. It proposes an *interparatransdisciplinary* program which takes interdisciplinarity as an *attractor* of transdisciplinarity. It aims at involving SCHOOL (all levels) in the creation of new knowledge/realities by focusing on contradictions according to *chaotic-solidaristic* approaches; projects about concrete problems and teaching-research-extension articulation at all educational levels; *interparatransdisciplinary* teams composed of school/university teachers, researchers, pupils, students, ONGs, productive sector, financial agencies, etc.; partnerships to develop those projects and pupils/students' talents; and scholarships to students/pupils *timely initiation* into such developments. The Program includes ways of implementation and the lines of research from which it has been originated.

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4. AN INTERPARATRANSDISCIPLINARY PROGRAMME FOR THE 21st CENTURY

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1. Introduction

Brazilian Governments have proclaimed the importance of egalitarian education. Accordingly, the actual Government pursues to enrol until 1998, 2,7 million of children between 7 to 14 years of age, yet out of school.

But there are still contradictions to overcome, resulting some from a possible narrowed definition of egalitarian education, others from the difficulty of articulating the various levels of the educational system, and others from the isolation which prevails between these levels and societal segments. This paper discusses and proposes concepts and practices, such as the *solidaristic and chaotic interparatransdisciplinarity and talents timely initiation* (SILVEIRA, 1993a, 1996, 1997) which will, hopefully, contribute to overcome possible contradictions. They originated from the studies which have been carried out under the following research lines: *Ideology and Socialisation, Scientific Initiation as a Democratic Process, and Environment, Chaos, Social Imaginary and Education.*

2. Egalitarian Education and one of its Major Contradiction

Egalitarian education has been referred to a process which celebrates the right *everyone* has to *school access* including the *sacrificed ones*, those who feel in their *entrails hunger for food* and love (FATHER VIEIRA, In MOTA,1980, p. xvii) *and* the *leftover* ones, *those who do not buy, or sell...nor are missed either* (ALVES, 1995, p. 21). Otherwise, the very definition of egalitarian education would be meaningless.

But although important, this definition may imply a narrow view of education, human rights, self-realisation, personal and professional identity. If so, it involves a major contradiction, which is *school access to all, but school permanence, progression and completion, only to a few.* This contradiction has

* Retired in April 1995.

already been illustrated by SILVEIRA et al. (1996): in 1994, there were 31 million of Brazilian children enrolled in primary schools, while 5 million were enrolled in secondary schools, and only 1,661,034 and 55,229 students were enrolled respectively in undergraduate and graduate studies. Such contradiction is not a new one, but no satisfactory answers have been yet implemented to overcome it. The following propositions may contribute to give egalitarian education both theoretical and practical meaning.

3. Reflections and Courses of Action towards Egalitarian Education

The thesis of this paper is that SCHOOL (all levels), society and governmental sectors have responsibility with egalitarian education, being such responsibility a radical commitment. At the educational level, a fundamental role should be rescued: the articulation between teaching, research and extension as a means of integrating the university, the secondary and primary education and society. At the societal level, the community responsibility with children formal learning should be implemented. And this responsibility includes the involvement of the productive sector, and other relevant segments of society. It is supposed that the practice of implementing such articulation shall affect the level of people's consciousness.

As to the Government, one of its main roles is to allocate due financial resources to all levels of education. Paradoxically, at the moment, the Brazilian Federal Government is supporting elementary/high school while shortening federal universities' budget, and even though, the Law-Decree no. 2.301 (November 24, 1997) has shortened the former.

There is an aspect, however, which has been little or never touched, though it refers to all educational levels mentioned above. It is the children's *talents timely initiation*. The middle class and elite, both systematically and in the proper time, can (and indeed they do) provide conditions for their children to develop their talents to science, music, painting, foreign languages, sport, computing, etc. But, what about the talents of the *sacrificed* and *leftover* ones? Are they to be left to their night and day dreams? The question - "what do you want to be when you grow older"- does not apply to them? Apparently, we have much to learn from the wisdom of *native people*, whose community as a whole cares for all their children.

Obviously, the roles performance of education, society and government must be planned, if egalitarian education is to have both theoretical and

practical meaning. Two main reasons may lead the Universities to become the key-agents of this process. First, they have (or should have) the teaching, research and extension functions already established, and the expertise to carry them out, though these functions are, in general, developed in isolation from each other. Second, it is at their levels that the contradiction of exclusion is most striking, if not of impossible return. Thus, it may be up to them to open their frontiers to discuss, to plan and to implement together with other educational levels changes in the status quo. But the primary and secondary educational levels may also lead this process. In practice, this would minimally call for:

a. The creation within an University, or within a primary and/or secondary school, of a multidisciplinary committee to co-ordinate the development of an integrated program which may be called of *solidaristic and chaotic interparatransdisciplinary* one (SILVEIRA, 1993a, 1996, 1977). This committee would be the program's *positional structure* (VLASCEANU, 1976) for it refers to the locus of the power structure or the decision-making process. Its main functions are:

i. To attract *relevant others* from other institutions, such as the representative of university teachers, researchers, extensionists, teachers of primary/secondary schools, decision-makers of educational and non-educational organisations, the productive sector, ONGs, financial agencies, community segments, etc., at local, regional, national and international levels.

ii. To discuss and agree upon *egalitarian education* as a relational idea (BERNSTEIN, 1971) of the *solidaristic and chaotic interparatrans-disciplinary* program to which all the program activities would be subordinated.

iii. To articulate the *positional structure* with its *fields of action* (SILVEIRA, 1993a,1996), being the latter the *locus* of the pedagogical practice. This would include the *educational field* (VLASCEANU, 1976), the *scientific* and the *extension fields* (SILVEIRA, 1993a, 1996, 1997). These fields involve the relationships between senior lectures/teachers, students/pupils, researchers and extensionists and *relevant others*, for the purpose of implementing egalitarian education through teaching, research and extension articulation. It is of great importance to establish, clearly and explicitly, and since the beginning, the *positional structure's* and its *fields of action's* activities, purposes, etc., for each institution involved in a given

integrated program. This would allow for both the location and the overcoming of possible contradictions during the planning, implementation and evaluation processes.

iv. To formulate an integrated program including projects articulating teaching, research and extension. The three functions would feedback each other and contextualize themselves within a given curriculum and day-to-day contents and meanings, while maintaining their own singularities. Obviously, the teaching, research and extension contents of each project would be appropriate to the needs, age, interest, maturity, period and levels of study, etc., of those involved. These articulations are supposed to contribute to the creation of a new order of relations between the three functions, the education levels, as well as the creation of new knowledge and new realities.

v. To establish partnerships aimed at guaranteeing financial support for the implementation of the projects; and participation in socio-economic and political debates from which guidelines for the formulation of public policies may emerge. Where there is a public policy, collectively, clearly and explicitly formulated, we believe that it would be much more difficult to maintain egalitarian education at the level of discourse only.

vi. To create, also by means of such partnerships, what we call the *timely initiation scholarships* (see below). They would give pupils/students involved, mainly the *sacrificed* and the *leftover* ones, an opportunity to develop their talents in a formal course, school, etc. while attending regular classes at primary, secondary school or university. Their spare time is then occupied by the development of a talent which otherwise could possibly fade out. If they were exposed since early age, to the methods of discovery, to the experiments of the scientists, as well as to piano, ballet, micro-computing lessons, etc., they would have better chances to develop, in full, specific talents. It is no wonder, therefore, that matters such as lack of opportunities for self-realisation in early ages tend to call out for deep-felt resentment in adult life.

b. The implementation of *solidaristic and chaotic interparatransdisciplinary* projects on an experimental basis. This is supposed to allow for both the disclosure and the correction of possible conflicts as soon as they emerge.

c. The continuous evaluation of the projects activities and changing where needed.

4. A Brief idea of Solidaristic and Chaotic interparatrans-disciplinarity

Interdisciplinarity has been defined by the OCDE/CERI as "an interaction between two or more disciplines that goes from a mere communication of ideas to a mutual integration of concepts, epistemology, terminology, methodology, procedures, data and the research and teaching organisation" (1972, p.23-24).

SILVEIRA (1993a, 1996, 1997) has argued that, in practice, interdisciplinarity has been, not rarely, confounded with multidisciplinarity (a collection of disciplines from various universes of knowledge) or pluridisciplinarity (a collection of disciplines from the same universe of knowledge), and put far from transdisciplinarity, as if the later would exclude the former. As a result, interdisciplinary contents may come to close themselves within strong frontiers, as it happens with multidisciplinary and pluridisciplinary approaches. This situation may reflect the novelty character of integrated codes (BERNSTEIN, 1971) in education and the fact that interdisciplinarity has no content of its own (SCHWARTZMAN, 1992). Besides, this approach refers not to the specific objects of a given discipline but to a problematic of a given context (SILVEIRA, 1997). Such difficulties led us to propose an approach, which would reflect, at least at this moment of innovation, the interaction process not as an end in itself but as a search for higher levels of integration such as transdisciplinarity. Hence, the term of interparatransdisciplinarity which may be simplified to paratransdisciplinarity.

But given the complexity of the situations this approach deals with, it may need to be both solidaristic and chaotic as well. Solidaristic because it is concerned with the actual generation's needs and aspirations without neglecting the quality of life of future generations. This is an ethical commitment which informs an amorous pact with our neighbours. And it is chaotic because it involves: (a) objective realities (e.g., human rights, public policies, knowledge, profits, etc.); and (b) subjective realities (e.g., desire to know, self-esteem, lack of interest, etc.). Some of these realities tend to operate as strange attractors (RUELLE, 1993; VESCHI, 1993), which are energetic fractions, whose fluxes spread out in a given context. The resulting effects will depend sensibly of the initial conditions (RUELLE, 1993), which are, according to the theory of chaos, not always clearly identifiable. Hence, the importance of an amorous dialogue (reflection and action, PAULO FREIRE, 1975) between such realities. It focuses on existing contradictory spaces, not on harmonic ones, as

the systemic approach argues; it does not hide or eliminate the former, treat them as seeds of change and man's creative acts (BERNSTEIN,1977,p. 171). Thus, the contradictions by means of solidarity may become the seeds for creating new knowledge and new realities. These ideas will be hopefully clarified as this discussion progresses.

Applied to a curriculum, for instance, the paratransdisciplinary approach can be planned to have, not strong but fractal frontiers (CIÊNCIA HOJE, 1993) such as the ramifications and borders of the leaves of a tree. Applied to the teaching-research-extension articulation, for instance, such frontiers are the antithesis of the strong ones which tend to separate these functions. So closely related, the three functions would feedback each other and contextualize their contents within a given curriculum and day-to-day meanings, while maintaining their own singularities. They also interchange contents within the subject matters of a curriculum and between them and those from other universes of knowledge. A result will be the democratisation of socially systematised knowledge (mainly through teaching), the discovery and revelation of the subject "ultimate mysteries" (mainly through research, and application of knowledge within the community (mainly through extension).

More specifically, such mysteries are the potential for creating new realities and new knowledge (BERNSTEIN, 1971, p.11). An paratransdisciplinary curriculum is supposed to reveal such mysteries very early the educational career (BERNSTEIN, 1971, p.11), i.e., in the primary/secondary levels, differently from conventional curricula which tend to do so only at the end of undergraduate/graduate studies. One would refuse the latter, for those mysteries would be then revealed only to a few, the so called "privileged" ones, and accept the former, for the mysteries shall be revealed to all. Besides transmitting socially systematised knowledge, therefore, teaching would then be somehow "forced" to rely on research as a method of discovery, as opposed to the method of reproduction (BOURDIEU & PASSERON, 1977). If the curriculum focuses on the pupils/students' capacity to create, then one of its aims would be the creation not only of new knowledge, but also of new concrete realities. To do so, that articulation would rely on extension to apply the revealed contents to day-to-day life (where applicable, of course). Hence, the importance of the University's functions and roles for formulating such projects and attracting relevant others from other levels of education, as well as from Government and societal segments to participate.

The teaching, research and extension articulation at all levels of formal education is a difficult and complex enterprise which calls for solidaristic and chaotic paratrans-disciplinary approaches, as already proposed. Agreement with this assertion may come if we ask why such articulation has not been yet largely implemented even within the University itself.

As we know, teaching, research and extension are, not rarely, carried out in isolation from each other, and without involving primary and secondary schools. Within such a model, especially in underdeveloping countries like Brazil, one can certainly find two forms of exclusion (among others): that from formal education and that from science. Paradoxically, formal education allow people to have access to socially systematised knowledge and to professional expertise, which is not the case for the majority of Brazilians, as already illustrated here. The same is true for science, for scientific initiation scholarships have been officially granted mostly to undergraduate students. We all know that this level of education corresponds to the apex of the socio-educational pyramid where there is no room for the sacrificed and leftover ones, who are the majority.

On the other hand, the included ones may also suffer from such a procedure (SILVEIRA, 1993b): because scientific initiation is, in general, institutionally offered very late in the educational career, it is likely that the included ones may come to be formally and systematically exposed to the various aspects of the scientific work by the very first time. In other words, their natural curiosity, creativity and creation, and other relevant talents to science may be already "out there", far from reaching. In this sense, the included ones may not be as "privileged" as they are usually called. Hence, our proposition of talents timely initiation scholarships, which illustrates the importance of granting scientific initiation scholarships to pupils from primary/secondary schools. This would not eliminate initiation from the undergraduate level, for there it would become advanced initiation (SILVEIRA, 1993b).

Similar reasoning may apply to the scholarships for the development of other talents, which are supposed to be available since the beginning of primary/secondary schools (if not earlier). They would give pupils/students involved in a paratransdisciplinary curriculum, mainly the sacrificed and the leftover ones, an opportunity to develop their talents in a formal course, school, etc. while attending regular classes at primary, secondary school or university. If they were exposed since early age, to the methods of discovery, to the experiments of the scientists, as well as to piano, ballet, micro-computing,

foreign language lessons, sport, etc., they would have better chances to develop, in full, specific talents, which could possibly fade out, otherwise. It is no wonder, therefore, that matters such as lack of opportunities for self-realisation in early ages tend to call out for deep-felt resentment in adult life.

5. Conclusion

In order to implement egalitarian education, the proper positional structure have to organise itself and activate their fields of action, so that they can integrate their activities, objectives, and purposes by means of a paratransdisciplinary curriculum. It is possible for a curriculum to have various paratransdisciplinary teams and projects according to relevant contradictions which may be identified and evaluated. This illustrates the importance of giving due regard to the chaotic aspects of a context. In fact, the complexity of integration calls for an agreed-upon relational idea, to which teams would compromise themselves. Other important point is to take the pupils/students, not as mere reproducers, but as the creators of the cultural capital. In this sense, they will certainly contribute to the creation of new developments and new realities. One of such realities is that of society responsibility for all children, being these the beneficiaries of scholarships granted by various sources. In return, after having completed their studies and found jobs, they would give some voluntary services to education. This illustrates the solidaristic character of an paratransdisciplinary program. If these and other ideas will come to be successfully implemented will depend sensibly of us. And the third millenium shall give evidence of our endeavours towards egalitarian education.

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PART VII

World Assembly Communique, Recommendations and Closing Ceremony Presentation

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Address of H.E. the Minister of Higher Education at the closing Session of the ICET 44th Conference

Your Excellency Al Sayyid the Minister of Education
Your Excellency the President of ICET

Dear audience

On the occasion of the winding up of the 44th Conference of ICET, hosted by the Ministry of Higher Education, I would like to extend my thanks and gratitude to all the participants from the Sultanate of Oman and those from the thirty-five countries who came all the way from their countries with all the willingness to benefit from the rich flow of presentations, research papers, discussions and deliberations that went on. The exchange of experiences, view-points and information by the participants and presenters has undoubtedly enriched the valuable topics of the Conference whose significant impacts focus on updating and innovating educational programs, in line with the requirements of human resources development and introduction of modern technology in instructional methods in order to meet the variables of our present time.

The rich recommendations and suggestions of the Conference announced this morning evidently show the great effort and work exerted by lecturers and participants in intensively discussing the Conference topics. We are absolutely confident that the findings, views and recommendations seen by the Conference would clearly have their impacts on the development of educational programs, academic planning and teacher education programs so as to cope with the modern technology, information systems and satellite communications.

The paramount importance of this Conference, with all the research and studies, the lectures and presentations made and the recommendations announced this morning have generated our decision to publish a comprehensive volume, which will be distributed to you due to the importance underlying the role of the Conference in enhancing modernization and development of teacher education programs all over the world.

I would like, on behalf of you all, to express our thanks and gratitude to the International Council on Education for Teaching for the great efforts they have shouldered in preparing for the Conference and cooperating in managing and supervising its convening.

I have the pleasure, as well, to extend our thanks to the members of the Host Country National Committee, Executive Committee, Conference organization committees, administrators and technicians, who have collaborated with us from different ministries, governmental institutions and the private sector for their great efforts in organizing and supervising the Conference and its concurrent functions.

All the thanks and gratitude to the prominent businessmen and members of Boards of Directors of Banks and Companies who, through their financial and moral support contributed to the success of the Conference.

I would not miss to thank H.E. Sayyid Saud bin Ibrahim Al Busaidi for kindly hosting the closing session of the Conference.

Rapporteurs Report

Redefining in-service and pre-service teacher education for a technologically-linked interdependent world

Topic one has been delineated by ICET to include all the research studies and innovative programs and practices related to preparing teachers, both pre- and in-service, to capitalize on advances in information and communication technology, such as multi-media and Intranet/Internet, while being sensitive to the effects of intranational/international linkages through information and communication technology, especially in terms of at-risk special groups.

Topic one has, by far, taken the Lion's share of the papers presented in this 44th ICET conference. In addition to the plenary sessions addressing issues relevant to topic one, a total of twenty-two (22) papers have been presented within the delineation of the topic across three (3) concurrent sessions. The twenty-two papers presented a full spectrum of scientific research strategies and methods, but all are bonded by the central concern of topic one, namely, the implementation of the technological advances achieved in the education and preparation of the pre- and in-service teachers for a technologically linked and interdependent world. To this effect, the papers presented within the domain of topic one reflected the different experiences, practices, innovations, aspirations, efforts, and concerns of countries such as Bangaldesh, Brazil, Brunei, India, Indonesia, Nigeria, Philippines, Sultanate of Oman, Taiwan, United Arab Emirates, United Kingdom, and the United States of America. But they have all been motivated by the shared convictions that the redefining of teacher's education and preparation for the 21st century is, and must be the central concern of all educators and educational policy makers all over the world, and that technology is now capable, and rapidly improving to present itself, in its different forms and ways, as the provider of the linkages needed for an interconnected world, and as the provider of the rapid and unlimited access to information. In this sense, technology could be the vehicle for reaching the goal of "education for all". However the papers presented within the boundaries of topic one have explicitly or implicitly asserted that technology must always be viewed as a means not as an end in itself.

Examples of the issues reviewed, investigated, or explored through the scholarly papers of topic one include:

- Reforms and innovation in pre-service teacher education.
- The use of computer simulated instruction in technical concept learning for future vocational learning.
- Training of educators on the use of the Internet and Multimedia as teaching aids.
- The *World Wide Web* as a tool to implement interactive in-service education.
- Interactive Electronic Conferencing (as in the Open University, Distance Learning, and the small world project).
- The extents to which teachers use available technologies.
- The importance of "Teaching Practice" in teachers' education programs.
- Selection of software and evaluation strategies for pre-service and in-service teacher training programs.
- Internet resources for professional development.

Due to the diversity of the issues tackled by the various papers it would only be sensible to present the recommendations which were generally shared and expressed by the majority of the papers presented:

Those Recommendations were:

1. Experiences in the reforms of teacher education should be exchanged and shared by different countries.
2. Teacher education should take into consideration the training of teachers in the use of computers in teaching.
3. Emphasis should be given to Teaching Practice and its articulation with other components of teacher education.
4. Future needs of students should be taken into consideration through a comprehensive review of educational programs.
5. The utilization of information technology in teacher education is of vital importance.
6. Selection of Software for pre-service/in-service teacher training should take into consideration:

   a. The needs and interests of the students as well as their levels of ability.

b. Selection of software should take into consideration the learning needs of the disabled.

7. Use of the Internet should be made available and accessible to the students as a major source of information. However, the necessary precautions should always be maintained.

8. Electronic information Access technology needs of pre-service and in-service teachers should be assessed and addressed.

9. The use of technology in teacher education should be regarded as a means and not an end in itself.

The papers presented within the domain of topic one have generated lively discussions across the various sessions. While the issue of the use of technology in teacher education has been well received by the participants, the following concerns have been widely expressed:

a. Cost of technological equipment and setup is viewed as representing an obstacle especially for countries with weaker economies, and for remote and underprivileged regions of even some developing countries.

b. The ability of modern day technology to cross the natural and political boundaries and borders is viewed as representing a threat to the values and belief system specific to some cultures.

c. Security of information exchange over the Internet has been raised as an Issue of concern.

Regardless of the above-sited concerns, the papers presented within the boundaries of topic one reflect a higher level of awareness concerning the need for a world wide collaboration and cooperation with regard to a technologically based interconnectedness.

Rapporteurs Report

Redefining excellence in Education by fostering partnerships education and business/industry in a Global place.

Theme

The interdependence of Higher Education and the world of business and technology.

In addition to the Oman plenary session addressing educational reform in Oman 4 papers were presented from different regions; U.S.A., Oman, Taiwan and Brazil.

Each of these papers presented us with a particular program in their countries that was aiming at excellence in Education based on collaborative efforts with the private sector.

Synthesis

These examples have shown us changes in trends from an isolated educational system to more global system with a great emphasis or improving the teaching and learning of mathematics, science and technology and a more active participation of Industry in the educational process.

Recommendations

- Strengthening the link between educational institutions, Business and industry to ensure the quality of education.
- In order to improve the quality of education, it is essential to update teacher education and training to be able to accommodate the need for information and communication technologies.
- The need to institute collaborative research and programs in preparation for markets needs.
- There is a tremendous need to bridge the gap between the ideal world of theory and the real world.

Concerns

One main concern is related to ability incorporate technology in the field and provide adequate facilities and equipment for such experience to take place and the appropriate methods to establish an effective and profitable linkage.

Topic Three

This topic dealt with improving the quality of teacher education through curriculum development. As such it focused on research studies and innovative programs and practices related to strategies to remodel curricula in order to prepare teachers and teacher educators for the 21st century with an openness to cultural diversity while capitalizing on the multimedia superhighway by connecting teaching and learning to the Internet and other distance learning facilities.

Main proposals, recommendations and points made included the following:

1. Teachers and parents need better understanding of thinking processes and their roles in enhancing thinking skills in children.
2. Teacher training should directly address the ways in which teachers can teach thinking skills, and way of getting support from parents.
3. Teacher graduates at all levels and in all specializations should be upgraded.
4. Teacher professional development is an essential part in building and operating educational systems in a world witnessing a great pace of change in various aspects of our life.
5. The implications of the use of the INTERNET in the education of youth and adolescents should be investigated.
6. Attention was drawn to curricular reformulation of the different levels and educational modalities, particularly of the teacher-training courses aiming at the Third Millennium where the globalisation, cultural diversity, and the use of technology will present themselves as the great challenges for education.
7. The difficulties encountered in defining ESP course content for different student specialities (such as Arabic Language, Islamic Studies, Social Sciences, and Natural Sciences) while at the same time ensuring overall language development were focused on.
8. Attention was also drawn to the concepts of "critical reflection" and "the teacher-as researcher" with reference to the pre-service training of foreign language teachers.
9. The point was also made that further research might suggest that teacher-training stories may be a way of promoting home grown educational renewal within institutional settings. Perhaps teacher-training stories will be important bridges to connect old century and new century educators.
10. The belief was expressed that strategies should be developed to encourage the involved students and prepare them to become independent life-long learners in order for them to be aware of the various information sources available to them including the Internet.
11. It is necessary to focus on reconceptualizing teacher education within a present-day context i.e. the information society.
12. It was also recommended that, since student evaluation is such an important part of their job, university teachers could benefit from instruction in testing principles and practice.
13. It was seen as important for teachers to plan effective social learning interactions within the classroom that will allow each student to learn, through observation, and social interaction with those behaviours and attitudes that will provide children and youth with a basis for generating habits related to a lifetime of positive openness to cultural diversity.

Rapporteurs Report

Promoting Professional Qualities of Teachers and Teacher Education

Challenges:

Due to the growing demands in Higher Education institutions to be accountable and to adapt to the rapid change of technology, the question of quality of university teaching programs in teacher education was raised. Research studies and innovative programs and practices from different countries shared common problems related to professional qualities of teachers and teacher education. The challenges can be described as follows:

- Quality of university teaching: Research, teaching, and community service are the main components of scholarship in higher education, yet little attention is given to the improvement of teaching. The lack of university center for teaching improvement inhibits the university from providing more positive contribution to the improvement of the quality of teaching.
- Rapid change of technology and increasing cost of education verses lack of funds: One of the major issues related to topic two was the concern for the rapid change of technology while some teachers are still using traditional methods of teaching. Research showed that some teachers do not recognize the need of professional development although they need it. The discussion of the audience revealed the concern about the increasing cost of technology in education while there is a lack of funds.
- Lack of sufficient cooperation between schools and colleges to improve the quality of pre-service and in-service training of teachers.

  Although partnership between professionals within colleges of teacher education and school system is essential, the implementation of any imposed systematic change is complicated by the beliefs, values and practices of the people in those systems.
- Children with special educational needs are segregated while research indicates that there should not be segregated classes for them. However, teachers are not equipped with the required professional knowledge and skills of how to deal with children of special educational needs.

Recommendations

The following recommendations were extracted from the research studies and innovation programs and practices to promote professional qualities of teachers and teacher education.

1. Student's assessment of teaching should be taken seriously.
2. Culture of pre-service and in-service teacher education need to be changed so that it contributes to the development of a national conceptual framework.
3. Partnership between schools and university is ideological.
4. Cooperation between staff of college and schools is required to develop the pre-service and in-service training of teachers.
5. The professional quality of teachers can be improved through real interaction between pedagogical content knowledge and the school subject matter knowledge.
6. University should engage in strategic thinking about their service and education roles in establishing communities of practice, which enables school teachers and academics to cooperate effectively.
7. Programs of teacher education should include special educational needs and technology education.
8. Some papers emphasized the need to identify or define the quality of good teacher. The school-practitioner model at the United State of America can be used as a guide for countries who seek to define the professional quality and characteristics of a good teacher. Seven tenets of the Model describing the relationships of the tenets to the professional qualities to be developed in prospective teachers were identified as:

- One who accesses, uses and generates knowledge.
- One who plans, implements, and models best practices.
- One who understands, respect, and values diversity.
- One who is a developing professional and a life long learner.
- One who communicates, cooperates and collaborates with others.
- One who makes decisions based upon professional standard and ethical criteria.
- One who is knowledgeable about teachers and teaching, learners and learning, and schools and schooling.

44th ICET World Assembly Communique

The 44th World Assembly of the International Council on Education for Teaching (ICET) meeting at Al Bustan Palace Hotel for the period 15 to 20 December 1997, in Muscat, Sultanate of Oman addressed the theme of "Promoting Quality Teacher Education for an Interconnected World".

More than 35 countries were represented in this World Assembly. Four major topics were addressed in plenary and concurrent sessions. These were:

1) Redefining in-service and pre-service teacher education for a technologically-linked interdependent world.

2) Promoting professional qualities of teachers and teacher educators.

3) Improving the quality of teacher education through curriculum development.

4) Redefining excellence in education by fostering partnerships between teacher/higher education and business/industry in a global marketplace.

Other critical issues related to the conference topics were also discussed in:

1) The C.Y. Tung forum on the interdependence of Business and Higher Education.

2) The Consortium for International Cooperation on Teacher Education Policy.

3) The ICET network for teacher education research and development.

Arising from these meetings, presentations and discussions the following recommendations have been made:-

1) The Assembly emphasizes the responsibility of ICET towards the professionalization and training of *all* teachers of *all* age in *all* countries.

2) ICET should be viewed, among other things, as a worldwide consultancy agency in academic matters, in pre-service and in-service areas of education and training. Universities, teacher training colleges and ministries should look towards ICET whenever the need arises for professional and academic support. Partnership between institutions involved in teacher education and training on the one hand and ICET on the other must be promoted.

3) ICET should seek to encourage home-grown developments in software as well as hardware and the extension and adaptation of these in order to respond to the needs of teachers.

4) The private sector is urged to support the ICET in the field of education i general and in teacher professionalization in particular to utilize the resources and expertise of ICET in helping teachers from developing countries to access the resources and expertise available.

5) The private sector should also, through ICET, invest in the transfer, use, application and extension of technology to teachers in 3rd world countries.

6) Teachers in all countries of the world and of all age should be introduced to and made comfortable in their handling of, technology. "Technology without fear" is a concept ICET should be empowered to pursue. Support is required and needed from governmental, non-governmental organisations and the private sector. Aid from international and regional organisations should be sought and initiated. UNESCO, ICESCO and GCC come at the top of these organisations.

7) Programs and equipment should be culture-sensitive, teacher-friendly, cooperative and minimally invasive.

8) The role of teachers working within "traditional" paradigms needs to be considered sensitively and with all due respect to the teachers concerned.

9) "Teachers of teachers" should be made aware of, and familiar with technological development.

10) ICET should incorporate more network type and workshop activities in the annual World Assembly where ideas and actual experiences and expertise of leading educators are shared with participants. This would be a major contribution on the part of ICET in capacity building.

11) Teacher educators and trainers should integrate technology in all courses. The need to do this is getting more and more urgent given the vast and fast development taking place at the present time.

12) The concepts and practices related to student centred teaching and learning should be enhanced and promoted.

PART VIII

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